

# Contractors and Engineers

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MAY 1956

*magazine of modern construction*

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Grading new Oklahoma pike.

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## The high cost of littering

With the summer vacation season approaching, state highway departments are again faced with the problem of keeping roadsides clear of litter ranging from chewing gum wrappers to beer cans.

Most states have long been concerned about this maintenance problem which, year after year, gets worse in practically all sections of the country. Harvesting the trash that springs up along the roadsides involves a lot of work. More important, the annual cleanup cost comes to a staggering sum of money.

In just three California counties—Los Angeles, Orange, and part of Ventura—the 1955 roadside cleanup bill came to \$3 million for the Los Angeles District Office of the California Division of Highways. In these same three counties, all agencies—state, city, and county—spent an estimated \$5 million on roadside cleanup.

About the only consolation for maintenance engineers of the California Division of Highways is that the roadside rubbish problem is not a local one. Large sums were spent last year to keep Connecticut's Merritt Parkway clear of facial tissue, empty cigarette packages, and candy boxes. The New Jersey Turnpike and other heavily traveled eastern routes last year allocated substantial amounts of



money for cleanup. And whenever maintenance engineers of highway departments meet, the problem of removing roadside rubbish has intruded more and more into their conversation.

The \$5 million needed to pick up roadside litter in three California counties is far too much money to be spent on this work, even assuming that these counties are the dirtiest in the United States. And if the amounts spent for cleanup on the nation's turnpikes, parkways, and highways is added to this, the total becomes appalling. These funds are needed for paving work and bridge construction. And they can be salvaged for such needed work.

Educating the public to the need for keeping roads clear is about the only way to solve the problem. How this is to be done depends on each individual highway department. But each driver should be made aware that the bit of paper he throws out of a car window adds to the total amount of trash on the highway, and that the

cost of cleaning up these roadsides is eventually paid by him.

The job of educating the public can be done in various ways. Hard-hitting speeches can point up the cost of keeping roadsides clean. Enforcing the penalty for littering roadways would do a lot to make drivers cooperate in a program aimed at keeping roads clean. Motion pictures showing some typical littered stretches of roadside, and emphasizing the cost and labor involved in cleaning it up, would be of invaluable help to highway departments.

Ironically enough, while the California Division of Highways was spending \$3 million to keep roadsides in three counties clean last year, it was unable to raise \$2,000 to cover the cost of a motion picture aimed at educating the public to the high cost of such work.

Now—the summer of 1956—is the time for highway departments to get to work on a public education program, and use every available tool to insure its success.



Long booms on the P&H truck crane and on the gantry-mounted American revolver speed from work, steel setting, and concrete placement for lock No. 19 on the Mississippi River at Keokuk, Iowa. The traveling forms fabricated by Mosher Steel Co., Houston, Texas, were designed by Records & Stephens Co., San Antonio, Texas, for easy resetting.

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### CONTRACTORS AND ENGINEERS

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CONTRACTORS AND ENGINEERS



# Ten-mile tunnel through rock is biggest part of sewer job

**Cofferdam, access shafts precede work on \$80 million interceptor; total of 58 downshafts and diversion structures will be built**

Work on a cofferdam and access shafts has started construction of a 10-mile stretch of tunnel that will go through solid rock under Pittsburgh, Pa., forming one of the main arteries of the \$80 million interceptor sewer for the Allegheny County Sanitary Authority. This sewer, varying from 48 to 126 inches in diameter, is part of a 63½-mile line that will serve 68 municipalities and prevent some 200 million gallons of raw sewage from going into the Ohio River every day.

The tunnel work is being handled by Dravo Corp., Neville Island, Pittsburgh, Pa., which holds a total of \$19 million in contracts and subcontracts for the entire project. Included in this are 58 downshafts and complex diversion structures, as well as five river crossings, that will bring sewage from existing city sewers into the interceptor.

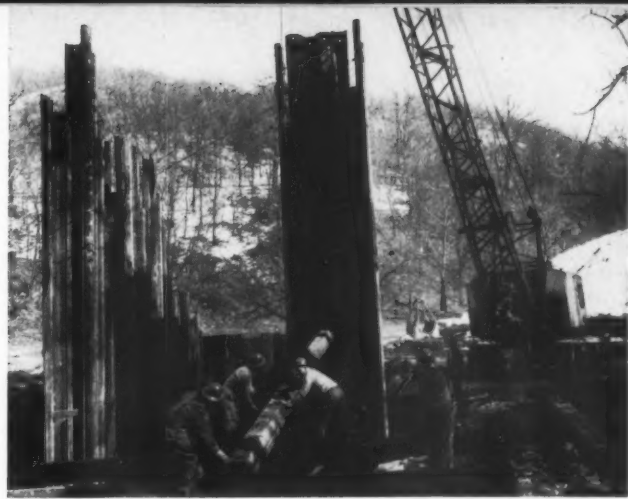
Only three access openings are being made for the long underground tunnel, which starts near Allegheny River Boulevard on the Allegheny River, then parallels the shoreline downstream to the Golden Triangle. Here it crosses the Ohio River, and stretches about three miles to the new sewage-disposal plant near the McKees Rocks Bridge. Sewage will flow to the treatment plant by gravity, since the level of the tunnel drops about 90 feet in its 10-mile length.

At the upstream end of the tunnel, a 140 x 16-foot cofferdam of steel sheet piling is being driven so that workmen will be able to excavate 28 feet of earth overburden and reach solid rock.

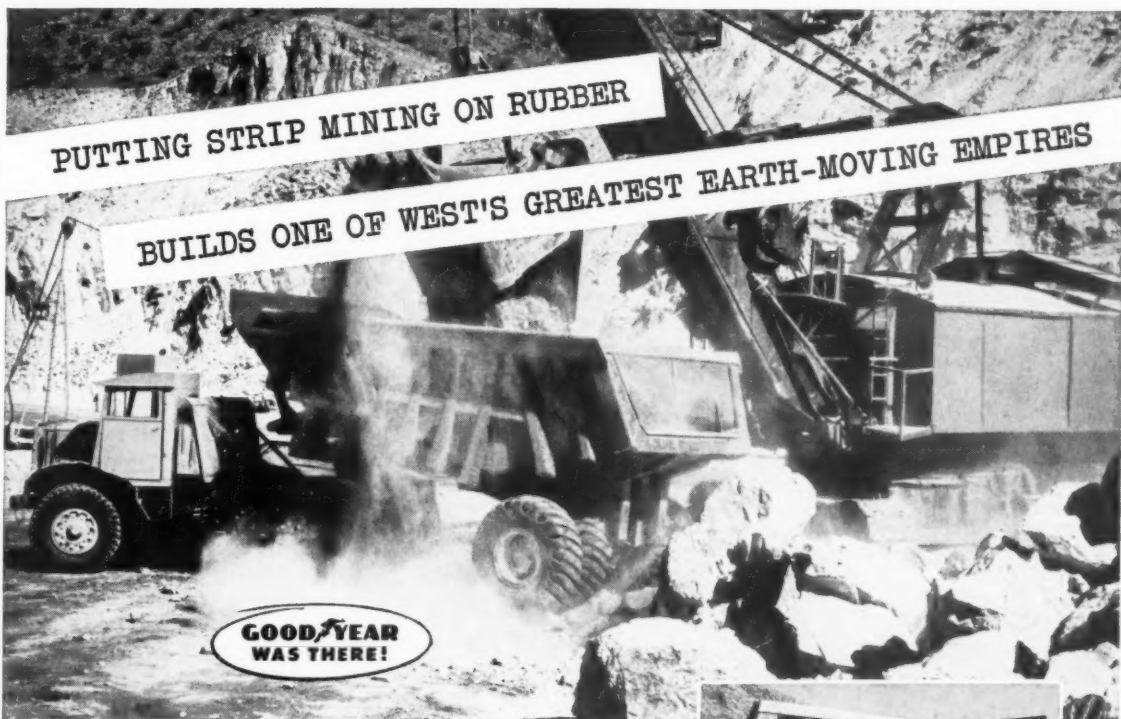
At the same time, concrete caisson-type access shafts are being constructed at 36th Street, opposite Herr's Island, and at Belmont Street. These circular concrete structures sink into the ground under their own weight as earth is excavated through an opening in their centers. The tunnel will be dug in both directions from these two access shafts, as well as downstream from the cofferdam.

Sewers, which now empty directly into the river, will be connected to the new interceptor by downshafts. These will have a box-like reinforced-concrete diversion structure to enclose the present sewer. Since the present system carries both sanitary and storm sewage, the downshafts will divert overflows when rainfall is heavy.

THE END



Construction of a 140 x 16-foot cofferdam of interlocking steel sheet piling marks the first step on the 10-mile tunnel project. The tunnel will be hewed through solid rock under Pittsburgh for the new \$80 million Allegheny County interceptor sewer system.



When the Isbell Construction Company was still a fledgling earth-moving outfit, strip mining was done on rails. By proving the greater speed and economy of rubber-tired equipment, Isbell became one of the country's leading mine strippers. In the last ten years, Isbell has moved over a quarter-BILLION tons of ore and waste —has built more than 1,000 miles of roads—now owns a multimillion-dollar array of mining and road-building equipment—and is still rolling ahead in operations from Canada to Mexico! Tires in this picture are Goodyear's famous Hard Rock Lug.

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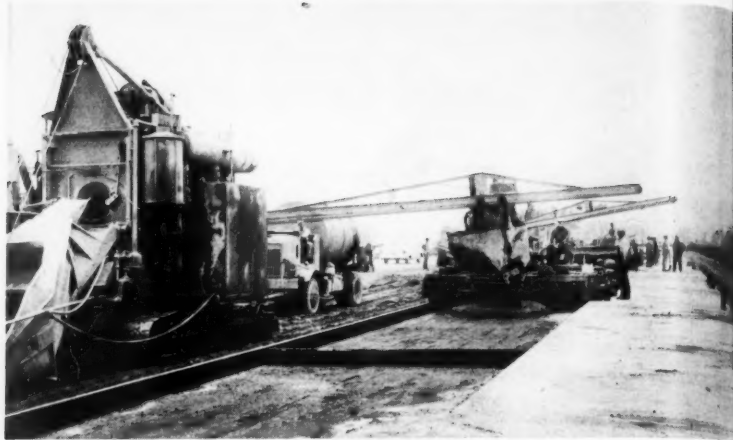
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For more facts, use Reader-Reply Card opposite page 18 and circle No. 202



A Blaw-Knox subgrader brings the roadway to final grade. Excess material is deposited along the median strip dividing the new roadway from the existing two-lane highway.

C&E Staff Photos



After the grade has been dampened and the forms oiled, the first MultiFoote single-drum paver dumps a 37.4-cubic-foot batch of concrete on the subgrade. The Jaeger spreader levels this off to a 6-inch depth.



When the spreader has gone by, workmen place a reinforcing mat on the 6-inch course. Additional concrete needed to bring the slab to a 9-inch depth is placed by a second paver, left.



Using a double-gated bucket on a 35-foot boom, the second MultiFoote 34-E paver dumps a batch of concrete on top of the reinforcing. The second spreader being used is a Blaw-Knox.

Both pavers riding on the median strip outside the forms are supplied with water by a 2,000-gallon water truck pulled by the first paver. The old two-lane U. S. 23 provides a paved haul road for the batch trucks.



## Two pavers, spreaders help concrete work move fast

**Paver setup, good batch plant location, and paved haul road enable contractor to place 300 feet of 12-foot lane hourly**

by ANTHONY N. MAVROUDIS, field editor

Battling against time to convert a 12¼-mile stretch of U. S. 23 from a two to a four-lane highway, a contractor used two pavers and two spreaders to make paving continuous and fast for the 9-inch-thick concrete slab required by the project. The existing highway, just south of Columbus, Ohio, was used as a haul road by the concrete batch trucks even while two-way traffic was maintained on the road throughout the course of the job. The double paver setup, paved haul road, and drive-through aggregate and cement bins enabled the contractor to pave 300 feet of the 12-foot lane hourly.

The 450,000 cubic yards of earth

fill, needed to widen the existing right of way and relocate approximately four miles of the road for a straighter alignment, had been put down some months earlier by Fischer Construction Co., Cincinnati, Ohio, under the \$2,091,000 contract for the job. This dirt work was handled by Heiliner, Caterpillar, Allis-Chalmers, and Le-Tourneau scrapers, and by Galion, Caterpillar and Austin-Western graders. Galion 5 and 10-ton tandem rollers compacted the subgrade to a 98 per cent density.

### Paving parade

The 9-inch reinforced-concrete roadway was put down in two 12-foot





Twelve hours after the slab has been laid, a workman with an Ingersoll-Rand Type 30 pneumatic pin puller removes the form stakes. The Blaw-Knox forms will be loaded onto trucks, moved ahead, and reset in the lane.

C&E Staff Photos

At the batch plant, just off the highway at the midpoint of the job, a batch truck gets sand and stone from an Erie AggreMeter. A Lima crane charges the 30-yard 3-compartment bin.



widths. A total of 12,000 feet of Blaw-Knox 9-inch steel forms were available during the work, and a minimum of 1,000 feet of forms was always in place ahead of the first paver of the train. The steel form stakes securing the forms to the manually prepared form trench were driven by a self-propelled Le Roi Tractair 105 air compressor.

A Blaw-Knox subgrader, riding on the forms ahead of the paving spread, prepared the subgrade by removing excess material from within the forms and disposing of it along the shoulder or median strip. A Buffalo-Springfield 5-ton tandem roller followed the subgrader closely, compacting the final grade and smoothing out the ridges left by the subgrader.

A MultiFoote 34-E dual-drum paver, with a mixing cycle of 1 1/4-minutes, rode outside the forms as it led the paving train. This paver, with a 35-foot boom and a double-gated bucket, placed enough concrete on the wet subgrade to allow a Jaeger spreader to smooth out a 6-inch thickness of concrete. Workmen then placed the reinforcing steel mats, which were designed to be exactly 3 inches below the surface of the 9-inch slab.

The second paver, a MultiFoote single-drum, also rode outside of the forms as it followed the spreader. This spreader used its 35-foot boom to place more concrete and a second spreader, a Blaw-Knox, topped off the complete 9-inch thickness. This double paver and spreader arrangement speeded paving by making it unnecessary for a spreader to make the second pass required when a single paver and spreader are used.

Water for both pavers was supplied by a 2,000-gallon water truck pulled by the first paver. A Fruehauf 3,500-gallon water tanker made the deliveries to the water truck, transferring water to the truck by means of its rear-mounted pump. The tanker received water from a supply tank, located at about the center of the project, which was kept filled with water pumped from Big Walnut Creek.

Following the Blaw-Knox spreader was a Jaeger double-screed finisher

(Concluded on next page)

THAT PHONE SURE IS HANDY, CALLIN' FOR SERVICE SINCE HE STARTED USING THOSE SUBSTITUTE PARTS!



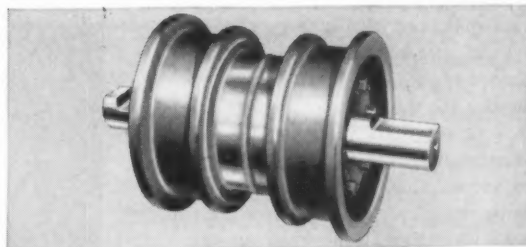
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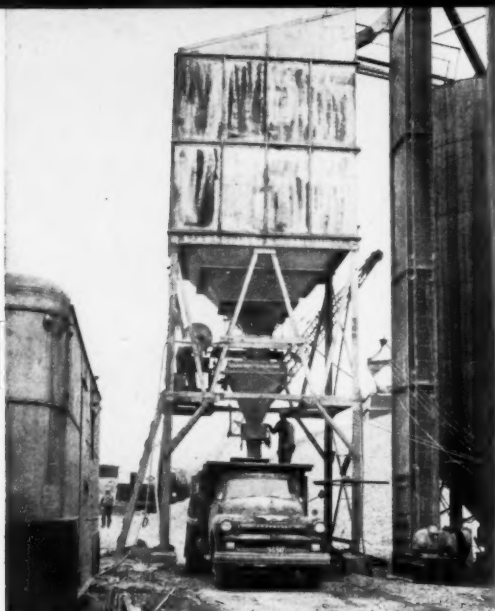
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After getting the aggregate, a Chevrolet batch truck picks up a load of cement from an Erie 375-barrel bin. At right are two Erie 615-barrel silos feeding the bin.  
C&E Staff Photo

trucks drove to the nearby cement bin to receive 847 pounds of cement per batch. Cement was weighed by a beam scale and released by electrical controls that were powered by a trailer-mounted Buda diesel located alongside the silos.

George Hines was the paving superintendent for Fischer Construction Co. Ed Long is the resident engineer for the Ohio Department of Highways.

THE END

#### Porter names executives

Charles L. Holbert has been appointed the executive vice president of H. K. Porter Co., Inc., New York, N. Y. As the firm's operating head, he succeeds retiring Clarence R. Dobson.

#### Sonneborn starts seminars on materials, maintenance

A "circuit-riding" sales seminar series, in which administrative and technical personnel meet division supervisors for the purpose of discussing new construction materials and regional building maintenance problems, has been instituted by L. Sonneborn Sons, Inc., Building Products Division, New York, N. Y.

The seminars, already held in Los Angeles, Chicago, and New York, will continue throughout this year. It was designed as a means of presenting the firm's field representatives with the latest developments in integral treatment of concrete, mortar, masonry surfaces, concrete floors, and grouting.

(Continued from preceding page)

and a Koehring transverse floating machine. As soon as the concrete surface had been finished with longitudinal floats, curing compound was sprayed onto the slab.

Contraction joints, spaced 60 feet apart, consisted of metal divider strips extending the full depth of the slab. They were supported by wire chairs so that paving could be done on a continuous basis. Each contraction joint supported twelve 30-inch-long dowels placed on 1-foot centers. Forms were stripped after 12 hours, the form stakes being removed with an Ingersoll-Rand Type 30 pneumatic pin-puller that made the stripping job fast and simple. As forms were removed, they were loaded onto trucks and moved ahead to be used again.

#### Central batch plant

All the concrete required for the project was supplied by the contractor's batch plant, which was located at the midpoint of the job, and near the highway so that it was easily accessible for the batch trucks.

The plant consisted of drive-through type aggregate and cement bins. Four stockpiles were maintained around the aggregate bin: one for 1-inch minus stone; two for ¾-inch minus stone; and one for sand. A Lima 802 crane with a 73-foot boom and a 2-yard clamshell bucket charged the Erie AggreMeter 30-yard bin with the three sizes of aggregates, while an International TD-18 tractor maintained the stockpiles.

Cement, also trucked in to the plant, passed through a screw conveyor, up an Erie 60-foot enclosed elevator, and into one of the two Erie 615-barrel storage silos. The silos fed the Erie 375-barrel cement bin through the enclosed elevator. The 16 Chevrolet, Ford, and International batch trucks used during paving had a three-batch capacity and were first charged with the aggregate and then with cement. The average 37.4 cubic foot batch, measured dry, contained 1,396 pounds of sand, 1,170 pounds of ¾-inch stone, and 1,756 pounds of 1-inch stone. Batches were weighed with a beam scale and released manually.

After receiving the aggregates, the

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MAY,



Working under the assumption that no highway program is complete without a roadside park program, Maryland has, in five years, opened 95 sites that serve half a million people annually. In winter, areas with ponds, like the Bel Air park, above, on State Route 22, are used by ice-skaters. As weather grows warmer, crowds grow thicker in popular areas like the Severn River Bridge Park, left, opposite Annapolis. The parks, which provide rest areas for drivers suffering from "motorist fatigue", are built on state-owned land or land that has been donated to the state by property owners.

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### Chesapeake Bay crossing under study by engineers

One of the longest vehicular water crossings conceived—crossing Chesapeake Bay from Norfolk to the Cape Charles area of Virginia—is currently under study by engineers.

The facility, which may possibly be a combination of tunnel, causeway, and bridge, was authorized by the Virginia Senate earlier this year, the legislation giving the Chesapeake Bay Ferry Commission the green light to build the crossing. The bill ordered preliminary studies to be made, and should the project prove feasible, will authorize the Chesapeake Bay Ferry Commission to issue bonds to finance the project.

Depending on the route to be used, the crossing would be from 14 to 21 miles long and would take from 3 to 3½ years to construct. The cost would be anywhere from \$125 million to \$200 million. The crossing will involve construction of causeways in shallow water and what may be the longest underwater tunnel in the world. The latter would be located in the main ship channel leading into Chesapeake Bay.

### American Hoist & Derrick program to aid dealers

A new program, designed to give its equipment distributors more assistance in sales promotion and market coverage, has been instituted by American Hoist & Derrick Co., St. Paul, Minn. The new program is being handled by a new sales development department headed by Don W. Martin. This department will provide dealers with sales and market information, promotional assistance at the local level, and other services designed to make the distributor's sales efforts more effective.

### New Iowa representative

A new member of the sales representative staff of Iowa Mfg. Co., Cedar Rapids, Iowa, Charles H. Kimball, is representing the Cedarapids line of aggregate producing and bituminous mixing equipment in Arizona, Colorado, New Mexico, Utah, southwest Texas, and southern California. His headquarters are in Scottsdale, Ariz.



## Stiffened roof reduces weight of exhibit dome



Aluminum shingles give a modern finish to the steel dome of the styling auditorium at the GM Technical Center in Detroit, Mich.

**Styling auditorium for cars has a roof of thin plates that does not require trusses and saves on steel**



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**MADSEN ASPHALT PLANT INSTALLATION**  
EFFICIENT • CLEAN • WELL-ARRANGED  
FOR MAXIMUM, PRECISION-MIX  
PRODUCTION



MADSEN engineers and the SATICOY ROCK COMPANY of Ventura, California, jointly worked out the details of this outstanding asphalt plant set-up.

Plant shown is the popular MADSEN Model 481 4000-lb. Batch Capacity Asphalt Plant. It is in full operation. Note the spacious working area around the plant, the well laid-out drives, and the underground asphalt storage area in the foreground. The SATICOY ROCK COMPANY selected the MADSEN Model 481 for its fast charge-mix-discharge cycle, its ability to produce close specification mixes on a production basis, and the many MADSEN features which make this plant one of the easiest to service and most economical to maintain.

If you are considering the purchase of an asphalt plant, talk to your MADSEN Distributor about the MADSEN Model 481. Learn about the 25 big MADSEN features that make this plant so outstanding. And, learn how MADSEN engineers can help you in planning the most profitable installation for your particular needs.

# MADSEN WORKS

CONSTRUCTION EQUIPMENT DIVISION

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### SOME FACTS ABOUT THE ABOVE INSTALLATION

OWNER—The Saticoy Rock Company, Ventura, California  
ASPHALT PLANT—MADSEN Model 481 4000-lb. Batch Plant  
MIXER—New MADSEN Model 440 Twin-Shaft Pug Mill Mixer  
VIBRATING SCREEN—SYMONS 48" x 14"—2½ Deck  
DRYER—MADSEN Counter-Flow 84" x 30'  
BURNER—12" Low-Pressure Air-Oil Burner Unit  
DUST COLLECTOR—MADSEN No. 380 "On-The-Square" Dust Collector  
WET SETTLING EQUIPMENT—MADSEN Triple Wet Tube Dust Washer  
TYPE OF FEED—6-Compartment Feed Bunker (Built by customer)  
POWER DETAILS—  
Mixer... 100 H.P. Electric Motor  
Hot Elevator... 15 H.P. Gear-Head Motor  
Dryer... 50 H.P. Electric Motor  
Burner Blower... 50 H.P. Electric Motor



CONSTRUCTION EQUIPMENT DIVISION

Perhaps the most unusual building at the new General Motors Technical Center in Detroit, Mich., is the circular auditorium, a dome with a 186-foot-diameter exhibit area for the firm's line of automobiles.

The dome uses no trusses; only a network of steel angles, together with outer columns, supports the thin sheet of steel that forms the structure. The roof itself consists of steel, of a thickness and weight substantially below those of similar structures.

The 40 rectangular columns, measuring 8 x 12 inches and standing 9½ feet high around the circumference of the building, support a circular box girder. This girder, 12 inches wide and 14 inches high, supports the dome. Extending 2 feet outside the ring girder is a horizontal rain gutter.

### Stiffening angles on thin plates

The main dome, having a spherical radius of 107 feet 4 7/16 inches, is made up of "orange-peel" type plates welded in four rows. The lower row next to the box girder has 80 plates; the second row, 60 plates; the third row, 48 plates; and the top row, 24 plates.

These ¾-inch-thick plates alone are enough to support an external load of 22 pounds per square foot. Of this amount, 16 pounds would be accounted for by the plate itself. But the stiffening angles on the underside of the plates makes it possible for each of them to carry a load of 55 pounds per square foot with a safety factor of three. The total weight of shell plates and stiffeners is 640,000 pounds. If the shell had not been stiffened, it would have had to be 0.59 inch thick to avoid buckling, and its weight would have come to 900,000 pounds. The weight of the stiffened dome is 71 per cent that of an unstiffened dome, saving a total of 260,000 pounds in the over-all weight of the structure.

The stiffeners used to give the plates extra strength are both radial and circumferential. The radial stiffeners are 6 x 3½ x 5/16 or 5 x 3 x 5/16 angles located 4 inches from one of the radial edges of each plate. Ring stiffeners are made of 6 x 4 x 5/8 angles for the outermost row and 6 x 4 x ½ angles for the other two rows. The stiffening rings are about 27 feet apart, measured along the arc. All angles were welded with webs, rather than flanges, against the plates to increase the stiffening effect.

Ring stiffening angles were all rolled to the shape of a great circle, with a radius equal to the radius of

CONTRACTORS AND ENGINEERS

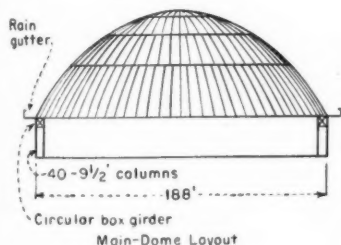
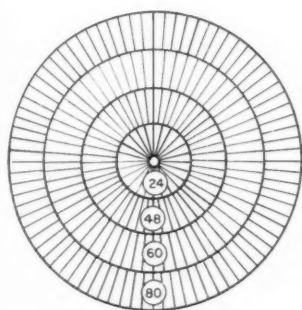


the dome. This made it possible for any stiffener to fit any shell plate by a single-curvature rolling. If angles had been rolled to form perfectly circular rings around the dome, they would have had to be rolled with a double curvature to fit the double-curvature plates. As a result of the rolling technique, the ring angles were not circular in shape, but were polygons of 40 and 24 sides.

#### Field welding

In the field, four plates for the first row were first preassembled on cradles and butt-welded before the stiffening angles were attached. The butt-welded seams had a 1/16-inch shrinkage allowance. Radial angles were welded to the plates with a 1/4 inch billet weld, which caused plates to shrink 1/16 inch in width. No allowance was made to compensate for this shrinkage, but the closing plate was made 3 inches wider for makeup.

After the first course of sections had been assembled, erected, and welded in place, a change was made in the erection sequence. Radial stiff-



ening angles were tack welded during preassembly and finish welded in the air after butt joints had been fitted to plates. This change produced a smoother surface, because it eliminated the bend in plates that resulted when the radial angle was welded solid during preassembly.

#### Ceiling finish

Inside the dome, hangars connected to the radial stiffeners provide support for the light-reflecting ceiling. The central part of the ceiling, the inner dome, is surrounded by a doughnut-shaped portion called the cove. Ceiling plates of both 12 and 14-gage steel are not dished to a double curvature. The individual plates were rolled to a cylindrical shape, but appear to be spherical in the completed assembly.

Radial beams are backed up by 2 1/2 x 1 1/2 x 3/16 angles, and the plates are lapped and welded. The ceiling plates are perforated with 7/64-inch holes, spaced 1/4 inch apart on a 60-degree triangular pattern. Altogether, 17 per cent of the ceiling area con-

sists of 70 million of these holes, which number about 2,666 per square foot.

Even with these perforated plates, the ceiling assembly adds a considerable amount to the over-all weight of the roof. The perforated plates weigh

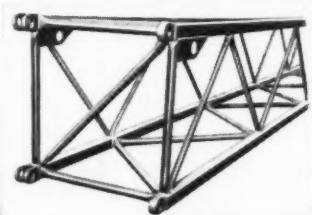
100,000 pounds; the radial-seam backing angles weigh 24,000 pounds; the hangars, 100,000 pounds, and lights, fans, and acoustical equipment, 46,000 pounds.

The total ceiling weight of 270,000 pounds, and the 640,000 pounds of the main dome give the roof a total weight of 910,000 pounds—a weight almost equal that of the main dome alone, had it been constructed without stiffening angles and shell plates.

Chicago Bridge & Iron Co., Chicago, and the architect, Saarinen & Associates, were responsible for the design of the roof, which permitted it to be built with less thickness and weight than similar structures. Bryant & Detwiler Co., Detroit, Mich., was general contractor on this job.

THE END

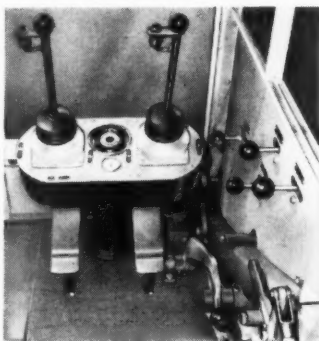
## 3 NEW LORAIN FEATURES



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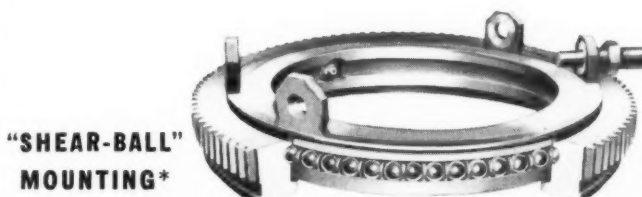
Greater strength at reduced weight. Permits increased lifting capacities, working with longer booms, raising longer booms from flat position and traveling with longer booms over the rear.



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These 3 new Lorain features are just some of the major design innovations announced recently by Thew-Lorain and now available on many models in the extensive Lorain line. To every shovel-crane user these features mean savings in time and money, better performance and increased profits on every job!

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Lorain shovel-crane are available in sizes through 2 1/2 cu. yds. ... crane capacities up to 61 tons. A wide selection of rubber-tire or crawler mountings.

**THE THEW SHOVEL CO.**  
Lorain, Ohio, U.S.A.

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Representing some manufacturers at the meeting, left to right, were D. W. Erskine, Allis-Chalmers; J. M. Hyler, chief engineer, tractor section of LeTourneau-Westinghouse; J. Borland, chief engineer, Wisconsin Axle Division of Rockwell, Spring & Axle Co.; H. C. Kirtland, Allison Division of General Motors; and P. J. Sperry, chief engineer, Industrial Power Division of International Harvester.

## Earthmoving industry studies new equipment

A record number of more than 1,500 engineers, scientists, and others packed meeting rooms at the seventh annual Earthmoving Industry Conference at Peoria, Ill., April 3 and 4.

Although it is conducted as an activity of the Central Illinois Section of the Society of Automotive Engineers, without professional assistance from SAE national headquarters, the conference is rapidly assuming nationwide attention and significance in the fast-growing earthmoving industry. The registration list this year included representatives of most of the manufacturers of earthmoving equipment.

In the opening address, Dr. Harold Vagtborg, president of Southwest Research Institute, San Antonio, Texas, declared that "Science and technology are the only multipliers of resources," which are being steadily and constantly depleted while the demands of the world's ever-increasing population continue to grow. "This indicates," he said, "that science and industry must produce more and more from less and less, faster and faster."

Following the opening address, a series of papers were presented on subjects ranging from "Torqmatic Drives for Tractors" to "Rebuilding Ruined Roads with Machinery."

### Design for serviceability

The first two technical papers showed industry's concern with two major problems of the equipment user. These were titled "Design for Maintenance" and "Design for Serviceability." They were presented by H. M. Bidwell, assistant chief engineer of Allis-Chalmers Mfg. Co., and F. A. Grooss, assistant to the vice-president of Caterpillar Tractor Co.

After noting that most current models of earthmoving machines require frequent servicing in several places and with several types of products, these speakers went on to stress the importance of simplifying maintenance operations. Their suggestions included "packed for life" bearing lubrication, central lubricating systems, standardization of types of lubricant, and foolproof location of lubrication fittings.

Mr. Grooss presented as a potential goal a machine which would operate in the field for a year without lubrication or servicing. The design of such a machine presents many problems to design engineers, but promises many advantages to the user in re-



## "Good-Will" techniques in blasting make good friends and neighbors

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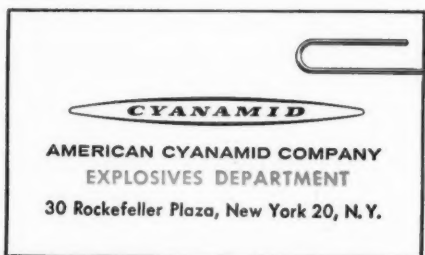
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**Annual earthmoving industry conference  
hears reports on equipment problems and  
new trends in design**



R. J. Furstoss, left, general chairman of the conference, looks over the program with Dr. Harold Vagtberg, center, who made the opening address. Dr. Vagtberg is president of the Southwest Research Institute, San Antonio, Texas. At right is John Warner, general manager of SAE.

duced operating and maintenance costs, and in lessened downtime.

Torque converters and automatic transmissions in earthmoving equipment, rising rapidly in popularity, were featured in a series of papers presented in the second technical session. The principal speakers were John Borland of Wisconsin Axle Division, Rockwell Spring & Axle Co.; Hugh C. Kirtland of Allison Division, General Motors Corp.; John M. Hyler of LeTourneau-Westinghouse Inc.; and Phil J. Sperry of International Harvester Co.

The speakers discussed the merits of several types of final drives ranging from the conventional gear train to the fully automatic push-button type. It was shown that these automatic transmissions, in addition to simplifying the job of the equipment operator, reduce shock and strain on engine and other equipment parts and speed operations.

In the question period following the presentation of the papers, it was brought out that the automatic type of final drives are more costly in initial investment and fuel consumption, but they are actually economical on the job because machines equipped with them produce more work in a given time.

On the last day of the meeting, E. H. Panthofer of Perfex Corp. spoke on "Cooling Problems Due to Mounted Equipment." He showed how the addition of more and more auxiliary equipment on tractors has increased the cooling problems, and suggested many simple and inexpensive means to improve air flow and coolant circulation to counteract these difficulties.

**The users speak**

Two of the papers presented on the final day were by men using earthmoving equipment in the field. One, called "The Use of Heavy Equipment in Logging," and presented by G. A. MacGregor of MacGregor-Triangle Co., Boise, Idaho, pointed out how modern heavy equipment has enabled loggers to harvest timber that, until now, was too costly to reach. MacGregor added that the use of standard earthmoving equipment for the construction of logging roads, and many specially adapted machines in other phases of logging work has made modern logging an almost completely mechanized operation.

(Concluded on next page)

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General All-Duty L. C. M.



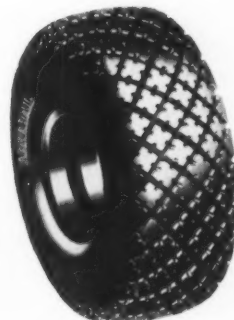
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(Continued from preceding page)

MacGregor gave the designers many ideas, suggesting that these be incorporated into earthmoving equipment to increase its usefulness in the mountainous western logging area. Many of these same improvements would also benefit contractors on road construction in similar areas.

#### The human side

Two talks stressing the importance of the individual in this highly me-

chanized and technical age rounded out the program. The first of these was presented at the evening banquet session by Tom Collins, publicity director of the City National Bank & Trust Co., Kansas City, Mo. The other was presented at the concluding session of the conference by George A. Bowie of Firestone Tire & Rubber Co.

The Earthmoving Industry Conference is unique among the larger meetings of this kind in that it is sponsored and conducted as an activity of the Central Illinois Section of SAE. Many

members of the section serve on the many committees that helped make the conference an outstanding one in the few years of its history. This year, R. J. Furtoss was general chairman of the conference committees. R. V. Larson is chairman of the Central Illinois Section.

THE END

*An aroused awareness of the weekend highway peril, plus continued realization of this danger is the only way to reduce the weekend fatality figures for 1956.*

## Number of changes made in AGC national staff

Since ill health has made it impossible for H. E. Foreman to resume full activities and responsibilities required of the chief executive of the Associated General Contractors of America, Inc., the executive committee has appointed James D. Marshall to assume the authority of the chief executive in the management of the organization. Marshall, executive director or assistant managing director for 17 years, will continue to hold the title of managing director.

In other changes made in the AGC national staff, William E. Dunn was made assistant executive director and Charlson I. Mehl, administrative secretary. Edward T. Kelly was advanced in the labor department, enabling him to assume more responsibility in this department. C. I. Mehl, for the past several years has been administrative assistant. Edward T. Kelly, a member of the Labor Department's staff for many years, and a member of the National Joint Board for the Settlement of Jurisdictional Disputes, has been advanced in the department so that he can assume some of the responsibilities previously held by Dunn.

## Asphalt and accident studies in HRB bulletins

Discussions of physical and chemical effects on asphalts, and a statistical analysis of highway accidents are included in two new bulletins from the Highway Research Board, 2101 Constitution Ave., Washington, D. C.

Bulletin 118, "Effects of Chlorination and Micro-organisms and Constituents of Asphalts" contains three papers, the first of which gives the bulletin its title. This paper describes the effect of chlorination and indicates that the oxidizability of the asphalt may be materially reduced by treatment with chlorine. The second paper contains results of an analysis with asphalts of various composition and derivation. The third paper discusses a new concept of asphalt oxidation in old bituminous surfaces. This bulletin is available from the board for 90 cents.

Bulletin 117, priced at 75 cents, contains two papers on highway accidents. "Accidents Versus Width of Paved Shoulders on California Two-Lane Tangents—1951 and 1952", is based on the analysis of 771 accidents that occurred in 1,122 road sections. The study shows that the accident rate tended to increase with shoulder width, except when traffic volumes were below 2,000 vehicles per day.

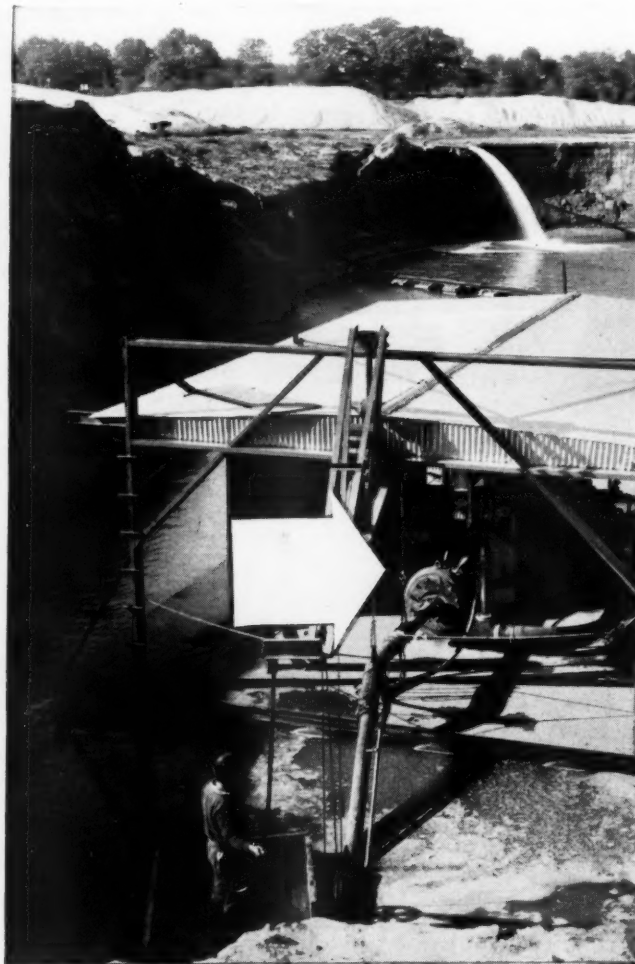
The second paper, "Application of Statistical Quality-Control Techniques to the Analysis of Highway-Accident Data", reviews techniques for the study of accidents, pointing out the advantages and disadvantages of current practices.

*All outdoors has a lot to offer during spring and summer. Everyone can help keep our roads clean by not strewing trash from cars.*

CONTRACTORS AND ENGINEERS

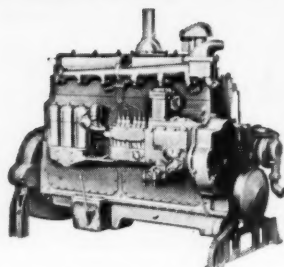
## PROOF OF PERFORMANCE!

After 8 years' experience with a D13000, "nothing but another Caterpillar Engine" was considered by the Wenonah Sand & Gravel Co. for its second dredge



This CAT\* D13000 Engine drives a 6" pump in a hydraulic sand dredge, operated by the Wenonah Sand & Gravel Co., Wenonah, N. J. There's a 70-foot lift through 600 feet of pipe to the wash tower. The engine, purchased several years ago, is the company's second D13000. According to Earl T. Kroll, Chief Mechanic, here's why: "Having used a duplicate of this engine in another dredge since 1946 with unquestioned economy and reliability, when we wanted to put another dredge into service, there was nothing but another Caterpillar Engine for us, a choice we haven't regretted."

This is just one of thousands of cases where the performance of one Caterpillar Diesel has sold another. There's a reason. These rugged units, available up to 650 HP (maximum), pay off in dollars and cents on the job. Simple to operate, they need a minimum of attention and maintenance. And they're sturdily built for a long life of low-cost use in every type of construction equipment. What's more, your Caterpillar Dealer stands back of them with prompt, capable service whenever and wherever it's needed!



**NOW IN THE CAT POWER LINE-UP: THE NEW D342, AN EVEN MORE EFFICIENT UNIT!**

Replacing the D13000, the more powerful, more compact 6-cylinder D342 delivers 210 HP (maximum). And with Caterpillar 4-cycle design, the fuel system requires no adjustment and there are no air boxes or cylinder ports to clean. Your maintenance is reduced to a few minutes a month for oil and filter changes. For complete information about this and other modern heavy-duty engines, see your Caterpillar Dealer.

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NEERS

A Bethlehem steel strand assembly, like that to be used in supporting the roof of a TWA hangar at Philadelphia Airport, shows a required ultimate strength of 784,000 pounds during a test on Lehigh University's big, new universal testing machine.

## Giant testing machine okays strand roof assembly

Instead of the customary ceiling beams or trusses, the new TWA hangar roof at Philadelphia Airport will be supported by twenty sections of 2 9/16-inch galvanized bridge strand that will, in turn, be supported in pairs by ten 28-foot-high steel tower posts set near the outboard edge of the roof. The strand will ride on a saddle set on the top of each post.

But even before the strand went into the novel facility, Bethlehem Steel Co. sent sample sections of the material to Lehigh University for testing on a giant new universal testing machine. The strand, made in Bethlehem's Williamsport plant, was fastened to 40 anchor rods by steel sleeve sockets, specially made for this use.

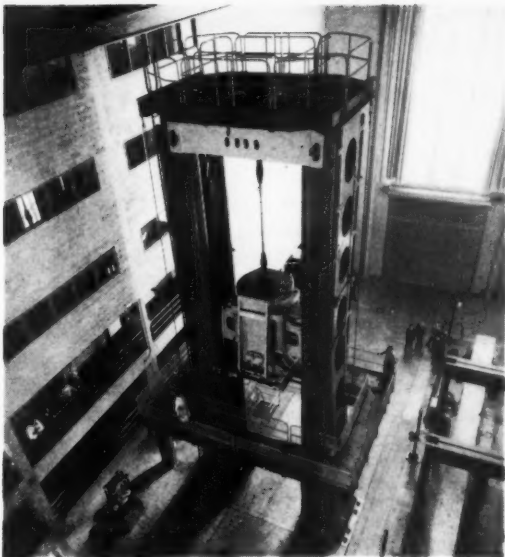
The threaded 4-inch diameter rods, measuring 11 to 32 feet, were alloy-steel quenched, tempered, and extensometer tested. Rolled and heat-treated at Bethlehem and threaded at the Lebanon plant, they were designed to withstand a 980,000-pound load. In one tensile strength test at Lehigh, one lot of rods was pulled apart only after being subjected to a load of 1,552,000 pounds.

In another test, an assembly consisting of a length of strand, socket, and anchor rod was tested to a required 784,000 pounds of ultimate strength.

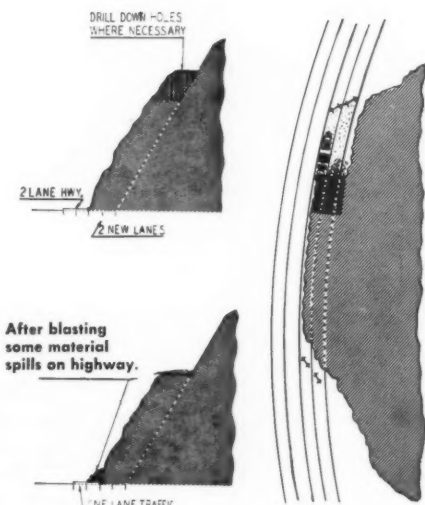
## Average speed of vehicles goes to new high in 1955

This is an age of speed, and not all speed records are being broken by supersonic planes. The U. S. Department of Commerce estimates that average speeds of motor vehicles on main rural highways—that is, on highways where motorists were free to choose their own speeds—set an all time record for 1955.

The new high is 50.7 mph, 0.7 mph above the 1954 figure. Comparative studies by 33 states showed that speeds for passenger cars, trucks, and buses were 52.1, 45.8, and 52.6 mph, respectively. An average of more than 50 mph was racked up by 57 per cent of the passenger cars, 27 per cent of the trucks, and 63 per cent of the buses. The greatest increase was recorded in the central and western states. A slight decrease was registered in the eastern states.



## Highway Widening Jobs Need Not Obstruct Traffic



Contractors can take highway widening jobs without building bypass roads to carry traffic.

The busy highway shown above is being widened from two lanes to four lanes using the method described at left.

The problem was solved by keeping the trucks and excavating equipment off the highway so that it remained open for traffic except at intervals when shooting was necessary.

The Eimco 105 Tractor-Excavator was ideally suited to this type of job. It loads large trucks full from the end and cleans up the big boulders quickly. With the Eimco operating in a straight line, forward to dig and load and reverse, with the bucket moving overhead, to discharge.

Digging in dirt and consolidated material can often be accomplished without blasting the material at all. The Eimco 105 will load in dirt at the rate of 10 yards per minute and in rock the rate of loading is 6-7 1/2 yards per minute depending on the material.

Eimcos are heavy-duty machines built to handle the toughest kind of jobs. They can apply more thrust force at the digging lip than larger equipment costing several times as much.

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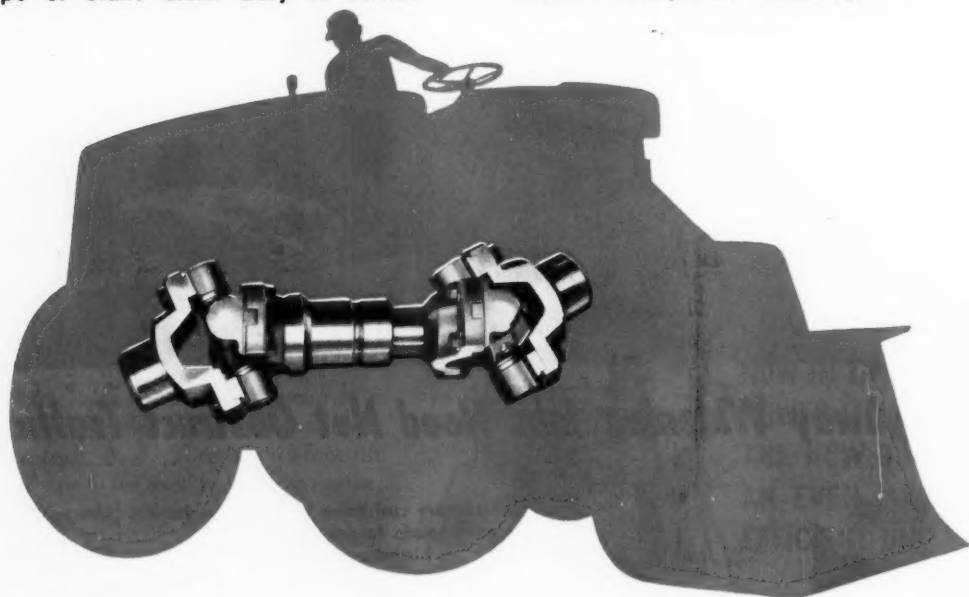


The men working on a project, we pointed out in a recent editorial (See **CONTRACTORS AND ENGINEERS** "Men and Machines", March, 1956, pg. 4), are sometimes de-emphasized by production figures and the results achieved through the use of modern equipment. But an increase in productivity, in construction or in any other area of industry, is dependent upon labor as well as on mechanization. With this in mind, **CONTRACTORS AND ENGINEERS** inaugurates a new department—Labor Review—in the hope it will be a useful monthly round-up of developments relating to construction labor.

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What its president, Maurice A. Hutcheson, called a pact to provide assurance against strikes or lockouts in the building of electric utilities, atomic energy plants, and other facilities has been signed by the United Brotherhood of Carpenters and Joiners. The agreement with the National Contractors Association is designed to give union carpenters first call on construction jobs.

Under the contract, the union guarantees to fulfill all requirements for skilled carpenters, while the association of 20 major contractors, accounting for construction exceeding \$2 billion a year, commits itself to draw its personnel from that source. The contractors will pay the wages established under local scales where construction takes place.

The union announced that the agreement would apply even in states with right-to-work laws that prohibit any form of compulsory union membership.

The Associated General Contractors, in announcing its official stand on wage-determination issues, promised a stiff fight against the inclusion of federal predetermination of wage rates in the highway bill it has been urging, and against the bill which would expand the Davis-Bacon Act to include fringes, welfare payments, and "prevailing practices" and would apply the law to all federally-assisted projects.

The AGC made it clear that it is not opposed to the payment of prevailing wages on a highway project, but it believes the job should be left up to the states. Spokesmen for the AGC made it plain they do not like the way the Labor Department has administered the Davis-Bacon law, saying that inaccuracies and delays have taken place and that federal policies have encouraged disputes between building unions.

The provision for the amendment of the Davis-Bacon Act, the AGC stated, is an attempt by the unions to obtain government assistance in making closed-shop contracts. Explaining this, AGC spokesmen said a requirement to have governmental contractors make all fringe payments would mean that an open-shop operator must send his contributions to a union-negotiated fund. Also, it was pointed out, if the federal government is to predetermine fringe provisions, the Davis-Bacon department will become involved in the interpretation of local contract detail, resulting in even more delay and interruption than presently exists.

Contractors who depend for supplies and equipment upon relationships involving the Teamsters Union have been given a new interpretation of the enforceability of "hot goods" clauses by the National Labor Relations Board. The NLRB has now taken the view that an employer and a union can lawfully include such a provision in a labor agreement, but the union violates the Taft Act's secondary boycott section if it notifies

**CONTRACTORS AND ENGINEERS**



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its members that they should refuse to handle the "hot goods."

The "hot goods" proviso was designed to free employees of any obligation to handle goods from a struck plant, or goods produced under allegedly substandard conditions or without a union label.

The new interpretation makes the "hot goods" clause more ineffectual than earlier rulings. It doesn't prohibit the inclusion of the clause in a contract, but prohibits the union from enforcing the clause "by appeals to the employees, and this is so whether or not the employer acquiesces in the union's demand that the employees refuse to handle the 'hot' goods." The union can support the clause only by appeals to the employer to honor his contract.

**Up in New York State**, 63 truck drivers employed on the St. Lawrence Seaway Project will find themselves from 60 cents to \$421.25 richer as a result of a decision by New York State Industrial Commissioner Isador Lubin. The payments, which add up to a total of \$6,111.51, were ordered because the drivers had been paid an hourly rate less than the \$1.80 to which they were legally entitled according to the prevailing wage provisions of the State Constitution and Labor Law.

A median wage settlement of 15.3 cents an hour was granted in collective bargaining agreements negotiated for construction-industry firms during the first quarter of 1956. An analysis of 28 such agreements showed that half were for increases of from 13 to 15 cents while the rest were for more than 15 cents an hour.

**Right-to-work legislation** will be the subject of drives in 15 states during the next year, the National Right-to-Work Committee announced. On the other side of the fence, the committee noted, there is activity in 12 of the 18 states with such laws to have them repealed.

A strike by operating engineers in Texas to force a painting contractor to hire union members on a full-time basis to turn air compressors on in the morning and off at night—operations which require less than 30 minutes a day—violates the jurisdictional strike ban in the Taft Act, the National Labor Relations Board has ruled. The union cannot strike, the NLRB said, "for the object of forcing or requiring the employer to assign disputed work tasks to its members rather than to the employer's own employees."

Average weekly earnings of contract construction workers climbed to \$96.48 in January of this year, compared to \$91.69 in that month last year, but were slightly under the \$97.62 level of December, 1955, according to the Bureau of Labor Statistics. The average weekly hours in January, 1956, dropped to 36, from 36.7 in December, but were higher than the 35.4 of January, 1955. Hourly earnings averaged \$2.68 in January, 1956, \$2.59 in January, 1955, and \$2.66 in December, 1955.

**Ten contractors in Omaha, Neb.,** want the courts to decide if the city council's ordinance setting up minimum wage rates for all construction contracts over \$2,000 is legal, in view of a section of the city's charter that requires contracts to be let to the lowest bidder. The contractors' attorney thinks the final answer will have to be determined by the Supreme Court and he does not look for a ruling before 1957.

The city's construction work sputtered to a standstill when the contractors decided to sit tight and await a ruling on the ordinance. To get work started again, the Omaha council re-

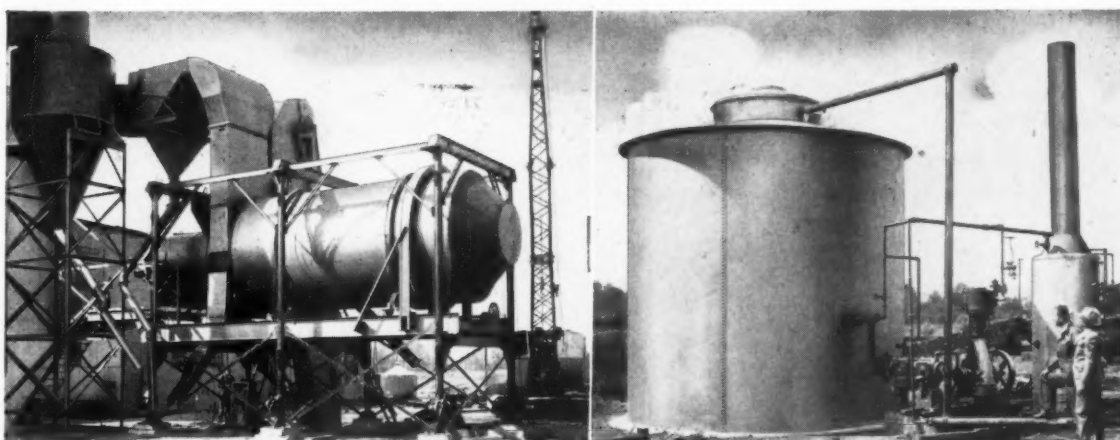
pealed all but one section of the law, leaving that section valid in order to test the legality of the entire idea. If the courts give it a green light, the entire law is expected to go back on the books.

**Writing another page** into the vexing volume on "roving situs" picketing, an NLRB majority reemphasized that it would continue to consider the secondary boycott provisions of the Taft Act violated when a union which has a primary employer's location at which to adequately demonstrate nevertheless extends its picketing to a neutral site.

The case involved concerns Teamsters' Local No. 657 and Southwest Motor Transport, Inc. The union has been picketing the Texas firm to get recognition, but the firm's drivers, whom the union is trying to organize, have been crossing the picket lines.

The union extended its picketing to the trucks on their stops at secondary firms. The NLRB found that the union was trying to get the secondary employees to assist it by pressuring them into refusing to do business with Southwestern.

The NLRB has already requested a Supreme Court review of a similar case.

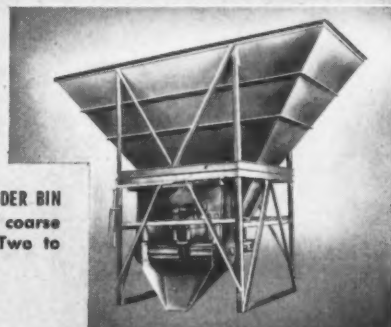


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will increase production on any make of plant and pay for itself in fuel savings alone.

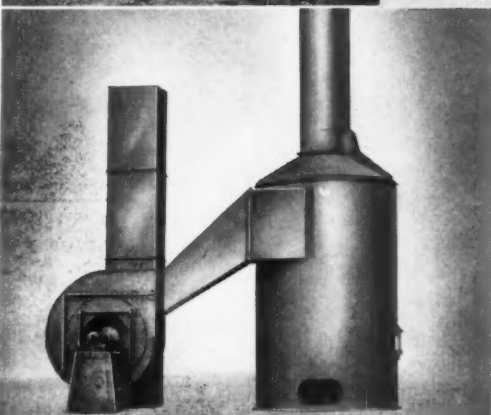
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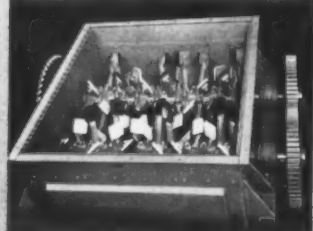
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**SIMPLICITY FEEDER BIN**  
for accurate feeding of coarse and fine aggregates. Two to four compartments.



**SIMPLICITY AIRWASHER**  
designed primarily for asphalt plants. Inexpensive but highly efficient in eliminating smoke and dust nuisance.



**SIMPLICITY PUG MILL MIXER**  
with Simplicity's exclusive double-zone mixing action.

**SIMPLICITY STANDARD UNITS**  
have improved the efficiency of other makes of asphalt plants. These improvements frequently pay for themselves on one job. Engineering recommendations on request with no sales annoyance.

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For more facts, use Reader-Reply Card opposite page 18 and circle No. 212

## manufacturer memos

### Intrusion-Prepakt names chief sales engineer

Intrusion-Prepakt, Inc., Cleveland, Ohio, a contracting firm specializing in the construction and maintenance of heavy concrete structures and



John A. Bader,  
chief sales en-  
gineer for Intrusion-Prepakt, Inc.

foundations, has appointed John A. Bader to the newly created post of chief sales engineer. He will supervise the firm's sales activities.

A registered professional engineer,

Mr. Bader is a member of the American Society of Civil Engineers and the National Society of Professional Engineers.

A new regional office has been established in Kansas City, Mo., at 4051 Broadway. Charles J. Berkel will manage the office, supervising field, sales and construction activities.

### Fulton Bag appoints four

Four men have been appointed to the general office of Fulton Bag &

F. C. Sivori, new  
director of canvas  
sales for Fulton  
Bag & Cotton Mills.



Cotton Mills, New Orleans, La. F. C. Sivori, former manager of the New Orleans canvas and pick sack department, has been named director of canvas sales. H. H. Rogers will be in charge of industrial engineering.

The new director of manufacturing is W. W. Plumb, and J. A. Banda will serve as director of export sales.

### Marion Sales Personnel

An expanded sales organization for the central states of Illinois, Michigan, Wisconsin, Indiana, and Kentucky, has been put into operation by the Marion Power Shovel Co., Marion, Ohio, under the direction of E. E. McCartney, Jr.

To assist him, three divisional managers have been appointed. L. G. Currie will cover Indiana and Kentucky from offices in Indianapolis, Ind. Wisconsin, northern Illinois, and northwestern Indiana will be handled by W. A. Shay, Jr., who will make his headquarters in Chicago, Ill.

R. B. Falck, from offices in Roseville, will be responsible for the state of Michigan.

The region's main office, where Mr. McCartney will maintain headquarters, is in Chicago.

The company has also transferred three sales representatives. The former southeastern area sales manager, Walter Pierson, has been assigned to the home office to assume the post of manager of the mining division.

Hugh Lewis will replace Mr. Pierson in his former post. Divisional sales manager William Garrison will assist Mr. Lewis. He had formerly held a similar position in the company's New York, N. Y. office.

### Cutcrete appoints new sales manager

Cutcrete Mfg. Corp., El Monte, Calif., has appointed Hal Frost to the post of sales manager. He was formerly sales manager of the Concrete & Masonry Division of the Felker Mfg. Co., Torrance, Calif.

The firm has also opened a new showroom and offices at 543 S. Tyler Ave., El Monte. Manufacturing and warehousing operations will continue to be carried on in another part of the city.

In addition, Cutcrete has acquired Concrete Machinery Ltd., Pasadena, Calif., as a new subsidiary.

### New Pioneer representative

Pioneer Engineering Works, Inc., Minneapolis, Minn., a subsidiary of Poor & Co., Chicago, Ill., has appointed Arthur W. Smith paver sales representative. He will give technical aid to Pioneer distributors in the United States and Canada.

## On housing development jobs...



## the No. 955 Traxcavator\* pays its way

From digging basements to building streets and grading lots, the new CAT\* No. 955 Traxcavator is a bear-cat for work, a money-maker for contractors.

The machine shown here is owned by R. & M. Construction Co., St. Louis, Mo. Working on an 83-home project in the Crestwood area of St. Louis, the No. 955 is in constant use, forming subgrade for streets, digging sidewalks, backfilling foundations, spreading and grading topsoil. Mr. Howard Skinker, Master Mechanic and Grade Foreman, says: "This new No. 955 is a big improvement in tractor shovels. The increased visibility and new bucket mechanism make it a much more valuable machine."

The No. 955 is one of three new Traxcavators in the Caterpillar line. Its bucket capacity is 1½ cu. yd. The No. 933 has a 1-cu.-yd. bucket; the No. 977, 2¼-cu.-yd. All three machines have balanced weight, traction and power to dig in hard material. They lift

loads surely and quickly and are easy to maneuver. One-hand bucket operation and a comfortable seat set high for visibility give the operator a break. There's a long-lived, trouble-free oil clutch of proved superiority. The 40-degree bucket tilt back at ground level assures full loads at every pass.

If you're looking for the right unit to meet your excavating and loading needs, ask your Caterpillar Dealer for a demonstration right on your job. You can trust his trained service men and factory parts to keep your Cat equipment in top working order.

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

# CATERPILLAR\*

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**MODERN HEAVY-DUTY  
EXCAVATING EQUIPMENT**

For more facts, use Reader-Reply Card opposite page 18 and circle No. 213





Arthur W. Bollard, general manager of the Bollard Asphalt Plant Division of Colonial Iron Works Co.

### A. W. Bollard joins staff of Colonial Iron Works

The former vice president and secretary of the F. D. Cummer & Son Co., Cleveland, Ohio, Arthur W. Bollard, has joined the Colonial Iron Works Co., also of Cleveland, as general manager of its newly created Bollard Asphalt Plant Division. In his new post, Bollard will direct all design, sales, construction, service, and installation activities of the division.

Bollard is the designer of the New York City municipal asphalt plant, considered to be the largest in the world.



William Rodgers, a new director of the Blaw-Knox Co.

### Blaw-Knox elects director

The vice president in charge of sales for the Blaw-Knox Co., Pittsburgh, Pa., William Rodgers, has been elected a director of the firm. He joined Blaw-Knox in 1953 as general sales manager.

During World War II, Mr. Rodgers served with the army as a lieutenant colonel in Africa and Italy.

### New B-L-H vice president and board member

The Baldwin-Lima-Hamilton Corp., Philadelphia, Pa., has promoted Joseph Rosecky to the position of vice president in charge of the company's Eddystone, Pa., plant. Formerly manager of manufacturing at Eddystone, Rosecky will direct all activities related to the plant.

The company has also appointed Henry Barnhart and Milton Steinbach to the firm's board of directors.

Mr. Barnhart heads the BLH Construction Equipment Division. Mr. Steinbach is associated with Wertheim & Co., a brokerage firm of New York, N. Y.

### Greer Hydraulics elects new member to board

Greer Hydraulics, Inc., of Jamaica, N. Y., has elected Fred M. Glass a member of the firm's board of directors. Also the senior vice president and chief executive officer of the Empire State Building Corp., Glass has also served as director of aviation for the Port of New York Authority.

Greer Hydraulics is an engineering-manufacturing company specializing in hydraulic systems, components, devices, and testing equipment.

MAY, 1956



OFFICERS AND DIRECTORS of the National Bituminous Concrete Association, Inc., look on while Donald O. White (second from right), director of Region V, congratulates Sheldon G. Hayes (center), president of the organization, on the success of the group's first annual meeting. Their smiles indicating approval of the gesture, the other officers are (left to right) Harlan Conly, director of Region II; H. W. Schroeder, director of Region IX; Paul R. Anderson, chairman of the board of governors; Mr. Hayes; Allen Snyder, secretary-treasurer; Mr. White; and H. K. Griffith, executive director.

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THIS HARDFACING ROD	FOR THESE CONDITIONS	FOR SUCH EQUIPMENT
VICTORALLOY	Abrasion and severe impact	Tractor rollers, dredge pump impellers, bucket lips and teeth, rock crushers, steel mill wobblers
VICTORTUBE	Severe abrasion	Scarfier teeth, dredge cutter blades, posthole augers, oil field tools, ditcher teeth
VICTORITE	Earth abrasion or sliding friction	Plowshares, cultivators, steel mill guides, cement chutes, shaft bearings, rolling mill guides
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VICTORITE 6	Red heat, impact, corrosion and abrasion	Blanking, forming and trimming dies; cams, hot punches, pump shafts
VICTOR TUNGSMOOTH	Thin cutting edges	Coal cutter bits, brick augers, pug-mill knives, screw conveyors

Available in a full-range of sizes for both acetylene and electric AC and DC applications, either hand or automatic. Order a supply from your VICTOR dealer today . . . look for this sign.

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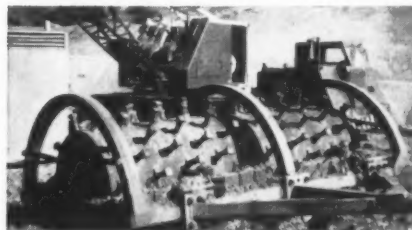
844 Folsom Street  
SAN FRANCISCO 7

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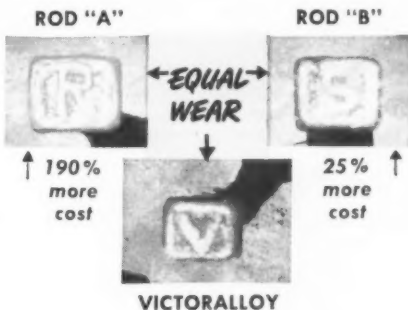
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**VICTORALLOY**  
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HERE'S EASY WAY TO MAKE TEST. . . Hardface an equal number of "feet" on a sheep's foot tamper, as this contractor did, with the different rods you want to test. (You could use bucket teeth or tractor rollers for the test, too). Position test teeth so each sample gets equal wear. Identify each rod by welding a symbol on its test samples.



MAKE A TEST "RUN", then check results. These unretouched photos show what *this* test revealed: equal wear, yet rod "A" cost 190% more, rod "B" 25% more than VICTORALLOY!



VICTORALLOY'S wearing qualities, ease of application and low cost saved this contractor a minimum of 25% in hardfacing cost!



Scrapers and tractors work to mend a breach in the dike leading from the shore to the sand island working platform for the center pier. Part of the dike was swept away when an ice jam caused the river to overflow the causeway.

C&E Staff Photos

## Man-made island forms for v

Ordinarily, a marine operation using floating equipment would have been used to build the midstream pier for the new Broadway bridge over the Missouri River at Kansas City, Mo. But since the contractor on the three main piers preferred dry-land operations to the floating type, a long sand dike was built out from the north shore to the middle of the river so that a sand island could be constructed at the pier site.

A joint venture of Guy H. James Construction Co., Oklahoma City, Okla., and Cunningham-Kiewit Co., Omaha, Nebr.,—with The James Co. as sponsor and director—did the work on a bid of \$932,300, nearly \$640,000 under the engineers' estimate of \$1,571,000 for the job. Once the dike was complete, the steel shoe of the big caisson was assembled on the island, and construction and sinking of the caisson began.

Though the remainder of the operation should have been the same for this pier as for the shore piers, ice in the Missouri River raised the water level until the river overtopped the ramp and washed much of the sand away. The river did no damage to the partly completed pier or to the equipment, which had been taken ashore as the water rose.

As soon as the flood waters receded, a pair of Allis-Chalmers HD-15 tractors with Gar Wood and Wooldridge scrapers started hauling sand from a nearby sandbar to repair the breach in the dike. Within three days after the work was interrupted, the ramp had been restored and work on the pier was resumed.

The washing out of the ramp caused the only delay on the job, which the contractor—gambling on the economical use of a minimum spread of equipment made possible with land-based operations—completed ahead of schedule.

### Three piers similar

The three large river piers are founded on cellular concrete caissons bearing on solid rock far below the bed of the river. Each caisson is 24 feet wide and 66 feet long and has rounded ends. Three open dredge wells, 16 feet in diameter, permitted sand and rock to be removed from the caisson.

When caissons had been sunk into the rock, the dredge wells were capped and cellular concrete piers with solid concrete caps were constructed above water. These heavy-stemmed T-piers rise to heights of 50.19, 66.63, and 85.69 feet above low water, while the caissons extend from



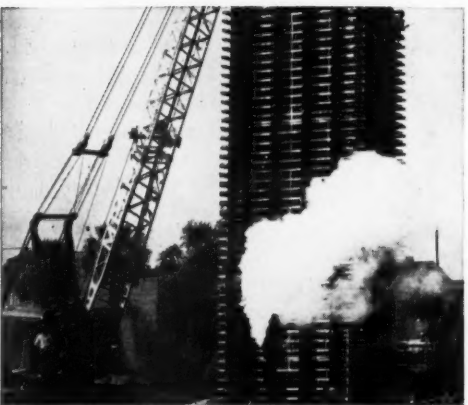
## For the Savannah River Bridge

all piles for 56 piers  
driven by

## McKIERNAN-TERRY HAMMERS



McKiernan-Terry S8 Single-Acting Pile Hammer driving piles for cofferdam of main pier



McKiernan-Terry E4 Double-Acting Pile Extractor extracting pile at approach pier

When Merritt-Chapman & Scott undertook to build the outstanding Savannah River Bridge and Causeway designed by Parsons, Brinckerhoff, Hall & Macdonald, they were faced by a tight schedule of construction on difficult soil conditions and terrain.

To make sure of speedy, trouble-free and economical pile driving, the contractor relied exclusively on McKiernan-Terry Pile Hammers, using an S8 Single-Acting Hammer, and two 9B3, three 10B3, and two 11B3 Double-Acting Hammers. A typical performance of these powerful machines was the consistent 9-hr day record of driving 35 piles 40 feet underwater by each of the McKiernan-Terry 11B3 Hammers. In addition, a McKiernan-Terry E4 Double-Acting Pile Extractor was used for withdrawing piles.

Contractors all over the world have learned they can safely rely on McKiernan-Terry equipment for their pile-driving jobs. Write for bulletins describing McKiernan-Terry Hammers and accessories for *your* next project.

### McKIERNAN-TERRY CORPORATION MANUFACTURING ENGINEERS

82 Richards Ave., Dover, N. J.

Plants at Harrison, N. J. and Dover, N. J.

MC 179

For more facts, use Reader-Reply Card opposite page 18 and circle No. 215



**A sand ramp, built out into the Missouri River, permits use of dry-land methods to sink pier caisson**

## ms for work on bridge pier

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36 to 55 feet below the standard low-water elevation. These three piers will support the superstructure of two of the main spans. Approach spans at both ends, and a fourth main-span pier, are being constructed under separate contracts.

When the superstructure is completed, the bridge will provide a link between the west end of the Kansas City business district and the airport. A new highway, which will skirt the airport, will provide a major artery for vehicles moving north, relieving present streets of extremely heavy traffic.

### Dike construction

A large sandbar along the north bank of the river at the bridge site made it possible for the contractor to build the dike and island for the middle pier with a minimum of haul. Two Allis-Chalmers HD-15 tractors, pulled by Gar Wood and Wooldridge scrapers and push-loaded by an Allis-Chalmers HD-5 tractor, were able to haul the material out onto the dike, dump it, and turn around on the narrow ramp to return for another load. As the scrapers dumped the sand, an International TD-24 tractor-doezer kept pushing the material ahead out into the river. The scouring action of the current caused some material at the end of the dike to be lost, but this amount was negligible.

When the dike had been carried out to the pier site, it was raised to a height of about five feet above normal water and widened to accommodate cranes, transit-mix trucks, and other equipment.

With the dike completed, a circular cofferdam, 80 feet in diameter, was driven at the site of the middle pier. This cofferdam protected the end of the dike against scour by the current and retained the sand island on which the caisson was built. The interlocking steel sheet piling of the cofferdam was driven 50 feet into the sand of the river bottom.

### Caisson sunk through island

The 2-foot-high steel shoe that formed the cutting edge for the pier was assembled on the sand inside the cofferdam. The reinforcing steel for the first lift of the caisson, welded to the steel cutting edge, made the cutting edge sections a little difficult to handle, but gave assurance that the shoe would be securely attached to the concrete.

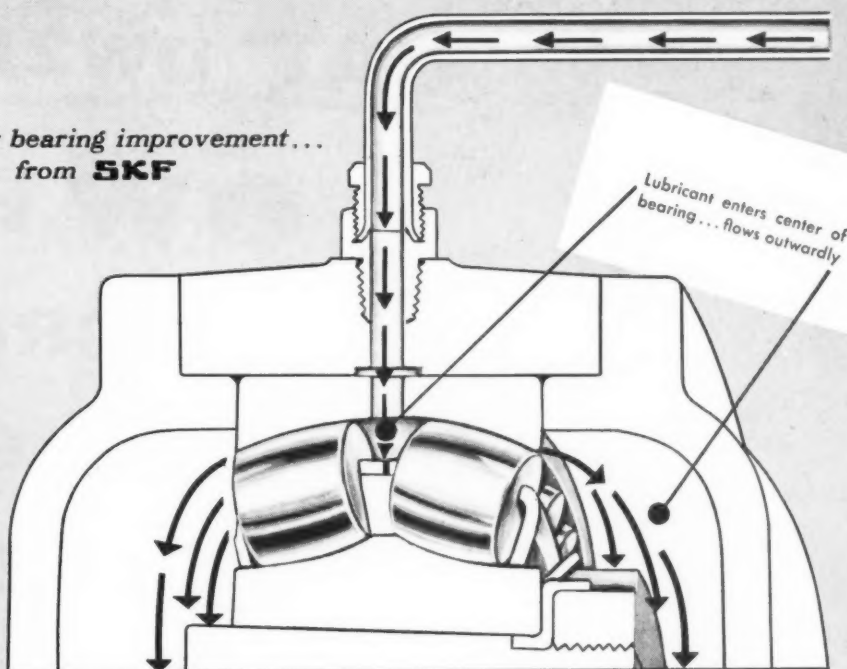
Prefabricated inside and outside steel forms designed by the contractor were set in place by a Northwest 80-D crane. These forms provided for

(Continued on next page)



An International TD-24 dozes sand into the gap separating the dike and the island. This work was completed in three days, allowing equipment to return to the job of sinking the caisson through the island to rock.

### Another bearing improvement... from SKF



## NOW AT NO EXTRA CHARGE— SKF's improved method of lubricating large spherical roller bearings

To make the lubricant effective it should be located where needed—in the bearing. Also, new lubricant, when added, should enter where it does the most good—in the bearing.

For these reasons, all future production of SKF double row spherical roller bearings above 240 mm O.D. (9.4488") will be made with three equally spaced drilled holes in the center of the outer ring without any extra charge to our customers. This permits the lubricant to enter the center of the bearing.

With the lubricant (either grease or oil) being introduced into the center of the bearing, all working surfaces are quickly and completely covered. In addition, the outward flow flushes out the old lubricant, and with it, any abrasive dust, dirt, moisture or other impurities.

And where circulating oil lubrication is required, there is a continuous flushing and cooling of the bearing.

This is another example of how SKF helps you to obtain longer bearing life.

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SKF INDUSTRIES, INC., PHILADELPHIA 32, PA.

—manufacturers of SKF and HESS-BRIGHT® bearings.

Consult your SKF District Office today for complete information so that you can be the first to incorporate into your products this improved method of lubricating large spherical roller bearings.

For more facts, use Reader-Reply Card opposite page 18 and circle No. 216

(Continued from preceding page)

a 16-foot lift of concrete. Transit-mix trucks delivered the ready-mixed concrete directly to the pier site. Concrete was usually placed at a rate of about 40 cubic yards per hour and, because of the very stiff mix used, four buckets were employed. These Gar-Bro 2-yard bottom-dump buckets were handled by a single Northwest 80-D or 95 crane, which placed the 350 to 400-yard lifts in about eight hours.

Forms were stripped the day after, and the concrete was cured with pads soaked with water. A Myers Injecto pump, set up to bring water from the dredge wells to the perforated hoses at the top of the curing pads, kept the pads soaked.

Since the project was started in November and carried on throughout

fold received high-pressure air through a 1-inch air line and discharged the air into the pipe through a series of holes in the casing.

Water was pumped at high pressure to the lower section of the manifold through a 2-inch water feed line. Six nozzles made of short pieces of 3/4-inch pipe pointed straight down from the bottom of the manifold. The water from these nozzles helped loosen the sand and keep it agitated as it was being drawn up into the pipe. An elbow and a short length of pipe at the top directed the discharge over the edge of the caisson.

Power for the operation of the air

lift was supplied from two sources. Air was furnished by a Gardner-Denver 500-cfm portable compressor. The discharge from the air manifold of the pipe used the full capacity of this compressor without excessive pressure drop.

A Goulds five-stage high-pressure pump with 5-inch suction and discharge provided the water supply. This pump was powered by a Waukesha diesel engine. The 5-inch discharge line of the pump terminated in a tee, and from here a 2-inch and a 4-inch line led to the dredge well. The 2-inch line fed water to the manifold at the bottom of the air-

lift pipe, while the 4-inch line was throttled down to supply just enough water to maintain the level inside the dredge well.

The big air lift pipe was set in place in the center dredge well by the Northwest crane and, as the air and water were applied, a pulsating stream of sand and water began spewing from the pipe. While the air lift was operating, the crane continued clamming from the end dredge wells to keep the caisson level.

The contractor used a clear plastic hose filled with water to check the level of the top of the caisson being sunk. At several points around the



The air-lift pipe is swung into the caisson by a crane. Air for this operation is supplied from the Gardner-Denver 500-cfm compressor, at left, while water is supplied by the Goulds high pressure pump, right.

the winter, concrete had to be protected and heated. When temperatures dropped below 40 degrees, the exposed parts of the caisson were covered with canvas, and heat was supplied under this cover by a Grinnell gas-burning unit heater, which had a capacity of 350,000 Btu per hour.

After a lift had been placed and cured, sand was dredged through the dredge wells inside the caisson to sink the big shell into the sand. After the first lift or two had been completed, the sand was dredged out by the Northwest 80-D with an Owen 1 1/2-yard clamshell bucket. As the caisson went down, an air lift was used to speed the operation.

#### Dredge with air lift

The air lift used on this job, built at the site, incorporated some features that were probably original. The main stem consisted of a section of 10-inch well casing, 57 feet long. A double manifold was welded around the casing near the bottom of the pipe. The upper compartment of the mani-

## CAT\* DW21 - NO. 470 LOWBOWL SCRAPER OUTLOADS COMPETITION IN ON-THE-JOB TESTS ON KANSAS TURNPIKE

**1. TESTS WERE MADE** on contractors' jobs on the Kansas Turnpike. They covered a period of three weeks. For each comparison, the competing units were loaded under similar conditions. Soil density tests were performed right in the loading area to provide an accurate measure of scraper load in pay yards.



**3. JOB STUDIES** showed that the new turbocharged 300 HP DW21 Tractor had the "go" to equal or beat other units in cycle time while carrying more pay yards. Other features contributing to this unit's success were large 29.5-29 tires, an efficient power train, synchro-safe brakes and the fast, responsive No. 27 Cable Control.



**2. FIELD ENGINEERS** weighed load after load as the competing units passed over a portable platform scale. By subtracting average empty weight from average gross weight, they determined average net load weight. In every test, the No. 470 Scraper with exclusive Caterpillar Lowbowl design consistently carried larger payloads.



**4. LOWBOWL DESIGN**, developed by Caterpillar, is a feature of the No. 470 Scraper. With this new concept, the bowl has been widened and lengthened, yet its depth has been decreased. But Lowbowl design is more than just dimensional changes. As the tests show, material is loaded with less resistance clear out to the end of the loading cycle.





outer circumference, short lengths of the hose were brought up and wired to the reinforcing rods projecting from concrete. Marks on the rods indicated the position of the liquid when the caisson was level, and any deviation could be easily read.

#### Use air to seat caissons

The sequence of job operation started with concrete being placed for the first two lifts of the caisson for the middle pier. Then the pier on the north shore was started. Forms were shuttled between these two piers until the caissons were down to rock. By that time, the pier on the south

bank had been started, and the same steel caisson forms were hauled around and used to build this pier.

When the caissons landed on rock, the upper portion of the dredge wells were plugged with concrete and 3-foot air locks and shafts were installed. Air pressure was applied to the working chambers at the bottom so that workmen could excavate into the rock with air tools and seat the caissons. Air for these pressure operations was supplied by a pair of Ingersoll-Rand, 1,025-cfm compressors driven by GM 6-71 diesel engines.

As soon as the first caisson had



Fred Potter, air superintendent, points out one of the air-lift nozzles that helps agitate the sand.

been seated, work began on the upper parts of the pier. As each section was finished, the forms were moved to the next pier and re-used. Three Northwest cranes were used, one at each pier. The two on the middle and north piers were 80-D models, and the one on the south pier was a Model 95.

#### Personnel

Supervision of the project for the James-Cunningham-Kiewit combine was handled by P. E. Leech, general superintendent for The James Co. Ray Spitler was field superintendent, Jim Williams was chief engineer, and Fred Potter was in charge of air operations. Operations were handled from a trailer office. The Broadway bridge is being built for Kansas City, Mo., with a \$13 million bond issue that will be repaid from tolls. Howard, Needles, Tammen & Bergendoff, Kansas City, Mo., designed the structure and is providing supervision of construction. C. R. Swanson, resident engineer for Howard, Needles Tammen, & Bergendoff, is representing the owners on the job.

THE END

## TEST RESULTS

No. 470 Lowbowl Scraper (18 cu. yd. struck capacity) vs Competition

### No. 470

AVERAGE  
LOAD

**18.1**

BANK CU. YD.

#### Scraper A

18 cu. yd. struck capacity

AVERAGE LOAD

**14.8**

BANK CU. YD.

### No. 470

AVERAGE  
LOAD

**18.1**

BANK CU. YD.

#### Scraper B

Sideboarded —  
18 cu. yd. struck capacity

AVERAGE LOAD

**14.3**

BANK CU. YD.

#### LOWBOWL ADVANTAGE:

3.3 bank cu. yd. per load

Test conditions: Damp silty clay—density: 3300 pounds/cu. yd. Weight comparisons: Average net load, pounds: No. 470—48,840; Scraper A—48,675.

Comments: On one load, the operator of Scraper A was asked to obtain maximum heap. It took 2.40 minutes of push loading to pick up a load which weighed 58,875 net pounds—less than the average load carried by the No. 470!

#### LOWBOWL ADVANTAGE:

3.8 bank cu. yd. per load

Test conditions: Sandy clay. Density: 3100 pounds/cu. yd. Weight comparisons: Average net load, pounds: No. 470—56,225; Scraper B—44,400.

Comments: Average loading time for both machines was comparable. In total cycle time, the DW21 had the advantage. Its transmission provided a better match to rimpull requirements, and its shorter turns saved time on the fill.

### No. 470

AVERAGE  
LOAD

**18.1**

BANK CU. YD.

#### Scraper C

18 cu. yd. struck capacity

AVERAGE LOAD

**14.3**

BANK CU. YD.

### No. 470

AVERAGE  
LOAD

**15.6**

BANK CU. YD.

#### Scraper D

Sideboarded —  
18 cu. yd. struck capacity

AVERAGE LOAD

**13.3**

BANK CU. YD.

#### LOWBOWL ADVANTAGE:

3.8 bank cu. yd. per load

Test conditions: Damp silty clay. Density: 3300 pounds/cu. yd. Weight comparisons: Average net load, pounds: No. 470—48,840; Scraper C—47,290.

Comments: Scraper C, like Scraper A and the No. 470, has a rated capacity of 18 cu. yd. struck. On the job, where results, not rated capacities, are the true yardstick of a machine's ability, the No. 470 Scraper with Lowbowl design decisively outloaded the other two.

#### LOWBOWL ADVANTAGE:

2.3 bank cu. yd. per load

Test conditions: Heavy clay, Swell about 40%. Density: 3440 pounds/cu. yd. Weight comparisons: Average net load, pounds: No. 470—53,550; Scraper D—45,630.

Comments: In the tests, Scraper D scored next best to the No. 470. Scraper D is the "old" DW21-No. 21, a unit that set records for high production at low cost the world over. Now, in the new DW21-No. 470, Caterpillar has produced a unit that's even better—and way ahead of competition!

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Your Caterpillar Dealer has a complete report of this on-the-job test on the Kansas Turnpike—as well as similar reports from other sections of the country. Ask him to show you the advantages of Lowbowl Scrapers on your job.

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

#### Volume on soil physics is revised, enlarged

Fundamental and applied aspects of soil physics are covered in "Soil Physics" by L. D. Baver. The book is now available in a third edition, from John Wiley & Sons.

The material in the new edition has been extensively reorganized. Two new chapters cover the principles of soil irrigation and drainage. There are new discussions on soil puddlability, the effect of chemical soil conditioners on soil structure, and the diffusion process in soil aeration. Information on hydraulic conductivity, soil moisture stress and plant growth, the importance of compaction on soil tillage, and wind-erosion processes are also covered.

Among subjects discussed are soil as a disperse system; the mechanical composition of soils; physical behavior of soil-water systems; soil structure, air, water, and temperature; physical properties of soils and tillage; and physical properties of soils in relation to erosion.

The 489 page edition, priced at \$7.75, may be obtained from the publisher, John Wiley & Sons, Inc., 440 Fourth Ave., New York 16, N. Y.

#### Joy names vice president

A. B. Dastrup has joined the Joy Mfg. Co. as a vice president of the firm. He will make his headquarters at the company's executive offices in Pittsburgh, Pa.

The former president of the A. M. Byers Co., also of Pittsburgh, Dastrup holds membership in both the American Iron & Steel Institute and the Association of Iron and Steel engineers.

—For more facts, circle No. 217

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For more facts, use Reader-Reply Card opposite page 18 and circle No. 218

## Asphalt Institute report on runway failures says blacktop not at fault

Displacement of foundation materials, rather than failure of blacktop, is the reason why pavements have failed at several heavy bomber bases, according to a report issued by engineers of The Asphalt Institute.

The engineers, who carried out the inspections at seven bases with the permission of the Department of Defense, claimed that serious pavement distress was found at only two of the bases. All seven of the bases—two in California, two in Arizona, two in Oklahoma, and one in Florida—were cited by the Air Force when it made its decision to curtail construction of asphalt pavements on military airfields.

In making the report, Institute engineers stated that pavement maintenance at these airfields is seriously neglected. This, coupled with the report that there is a need for heavier airfield pavement design, were given as reasons for pavement distress found at two bases.

This report by the engineers confirmed findings of the special committee of the Highway Research Board that made a study of 27 major airfields and reported a lack of proper maintenance at virtually all of them.

At none of the four bases inspected in California and Arizona, according to the engineers' report, was pavement distress serious enough to impede normal operations. Evidence of distress was found in only one of the two bases visited in Oklahoma. At this base, serious rutting could be traced directly to displacement of foundation materials. At the seventh base, in Florida, dips were found in the pavement at intervals of 100 feet along the centerline of the runway. This, causing aircraft to "porpoise" at high speed, was again traced to a fault in the foundation.

According to the report a revision in airfield pavement design might be in order. Present design criteria are based on the assumption that aircraft will use the entire width of taxiways and runways. But heavy bomber traffic, channelized along the centerline, established a pattern of pavement stress that calls for heavier pavement design to carry the narrow concentration of loading. The channelization of heavy wheel loads, said Arvin S. Wellborn, chief engineer of the Institute, is resulting in accelerated attrition of airfield pavements, regardless of type. The answer to the problem, according to Wellborn, is a heavier design and more attention to better foundations and proper drainage at airfields.

## Clark names manager of parts and service

The Clark Equipment Co., Benton Harbor, Mich., has appointed Alvin E. York manager of parts and service for the company's construction machinery division. Alva L. Arend will serve as parts supervisor. York was formerly with Link-Belt Speeder Corp.

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## Japan's tallest dam ready for operation

One of the first big construction projects undertaken by Japan since regaining her sovereignty—the 492-foot-high concrete dam on the Tenryu River between Yokohama and Nagoya is being brought to completion this month and will be in operation shortly. Designed with American aid, and built by Japanese with American equipment, the new dam will provide an additional 350,000 kw for the country.

Four small dams are already located on the Tenryu, which drops 2,500 feet in its 100-mile length. The river runs through granite hills to the Pacific, and while its flow is very small during the dry season, it develops a flow about half as great as that of the Columbia River during the rainy summers.

Guy F. Atkinson Co., South San Francisco, Calif., served as consulting engineers on the project, while two Japanese contractors built the dam and powerhouse.

Part of the work included moving a railroad line from the Tenryu valley to a nearby valley, building a six mile road in a cliff to link three villages, and constructing a railroad bridge across the river to the site of construction.

## Travel and revenue increase on N. Y. Thruway

The 1956 toll revenue for the first quarter on New York's Thruway system comes to a total of \$3,367,796.52, with the March revenues accounting for \$1,228,646.15 of the total. This represents an increase of 15 per cent over February, when revenues came to \$1,066,500.76.

Vehicles using the Thruway traveled a total of 72,157,965 miles in March, an increase of 21 per cent in the 59,572,664 mileage total recorded for February.

## Cummins elects directors

Three new members have been elected to the board of directors of the Cummins Engine Co., Inc., Columbus, Ind. H. E. Bollwinkel, C. R. Boll, and R. B. Stoner were appointed, bringing the number of board members to fourteen.

Other officers of the firm elected at the same time were C. L. Cummins, honorary chairman of the board; J. I. Miller, chairman of the board; R. E. Huthsteiner, president; E. D. Tull, executive vice president; V. E. McMullen, C. R. Boll, H. E. Bollwinkel, D. J. Cummins, C. R. Fox and R. B. Stoner, vice presidents; W. M. Harrison, vice president, secretary, and treasurer; and W. J. Manning, assistant secretary and treasurer.

## New Timken sales manager

The Timken Roller Bearing Co., Canton, Ohio, has promoted Ross Hershey to the post of district sales manager for the Buffalo, N. Y., district. He was formerly a sales engineer with the Detroit office.



This spring, actual construction began on the Brownlee Dam on the Idaho-Oregon border. Starting the 3½-million-cubic-yard excavation job, a Bucyrus-Erie 71-B, powered by a Detroit Diesel 6-110 engine, loads material to a fleet of Euclids. Morrison-Knudsen Co., Inc., Boise, Idaho, is the contractor.

13

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Drawbar horsepower on the redesigned TD-14 has been increased to 78.5, reportedly making it the most powerful crawler in its size class. ▶



Improved shoe design with greater vibrating energy gives you even faster single-course compaction . . . and one machine handles the widest variety of sub-base materials you are likely to encounter.

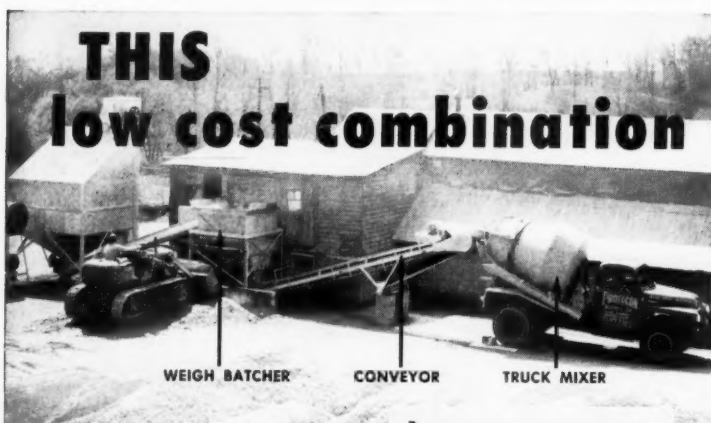
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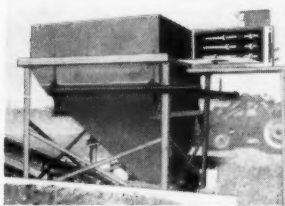
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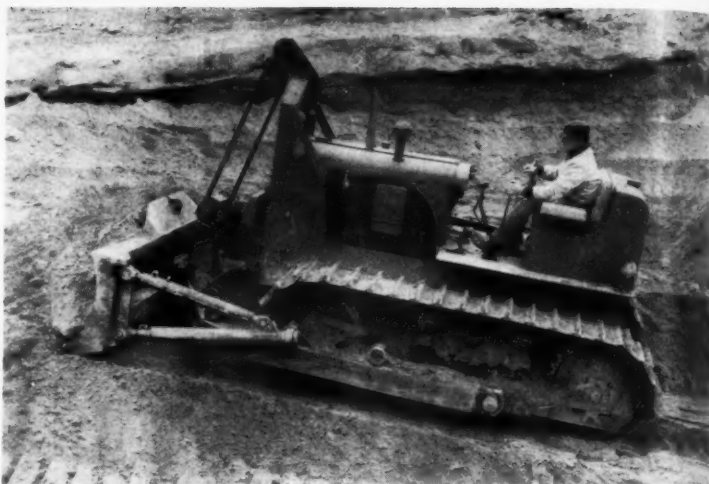
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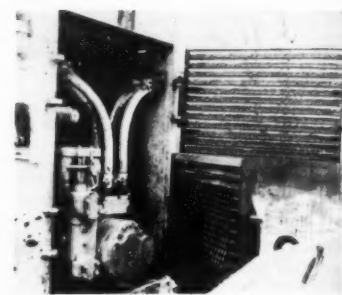
## Redesigned crawlers boast greater horsepower, other engineering and operational improvements

■ Important engineering changes—including a step-up in horsepower rating for three of the models—are announced by International Harvester for its TD-18, TD-14, TD-9, and TD-6 crawler tractors.

Chief among these improvements are increased horsepower for the 14, 9, and 6; a streamlined "new look"; better operator visibility; Cerametallic clutch facings; pressurized covering system; 500-hour track roller seals; and all-weather easy-starting conversion system.

The power rating increases average out to 11 horsepower per model.

The largest of these improved models, the TD-18, now sports 500-hour track roller seals, heavier radiator guards which are hinged to permit servicing accessibility, and streamlined appearance. International's fast gasoline-conversion electric starting system is standard equipment, as well as the Cerametallic clutch facing which is said to give more rapid and



Hinged radiator guards on the TD-18 and TD-14 permit easier servicing of front-end hydraulic pumps.

positive engagement because of its heat-resisting, power-holding characteristics.

The TD-14 has been given a new drawbar horsepower rating of 78.5 with belt horsepower increased to 89.5. This rating increase, according to the company, makes this model the most powerful crawler tractor in its size class. Cerametallic clutch facings, hy-

## WISCONSIN-POWERED CONCRETE SPAN-SAW Cuts Costs . . . Speeds Up Work

Used for diamond-sawing control joints in new highway and airport concrete, this Felker Di-Met Span-Saw spans the concrete slab, riding either the header boards or concrete.

Powered by two Wisconsin Air-Cooled Engines, this multi-bladed machine saws control joints at desired intervals and, according to the builders (Felker Mfg. Co., Torrance, Calif.), speeds up work, cuts costs and minimizes manpower. Wherever there's tough, dirty work to be done, Wisconsin Engines rate "Number One" in steady-going performance, low-cost maintenance and heavy-duty dependability. Every Wisconsin Air-Cooled Engine has such features as tapered roller bearings at BOTH ends of the crankshaft, rotary type high tension outside magneto, pump-circulated lubrication and efficient AIR-COOLING at all temperatures from extreme sub-zero to 140° F.

Specify "Wisconsin Power" for your equipment. Write for Bulletin 5-188.



**WISCONSIN MOTOR CORPORATION**  
World's Largest Builders of Heavy-Duty Air-Cooled Engines  
MILWAUKEE 46, WISCONSIN



For more facts, use Reader-Reply Card opposite page 18 and circle No. 334

CONTRACTORS AND ENGINEERS



draulic steering clutch boosters, and streamlined appearance are also incorporated in this model, as well as the hinged radiator guards.

Besides the clutch facing and streamlining features, the TD-9 now includes a regrouping of controls for easier operation, and a new fold-over seat which facilitates servicing of the steering clutch assemblies. Horsepower ratings for the TD-9 are 54.5 drawbar and 66 belt.

The TD-6 has received perhaps the most extensive redesigning of the four models. Drawbar horsepower is up to 41.5. The new clutch facings, streamlined appearance, improved operator's seat, and new non-skid steel deck for the operator's platform are features. Controls have been regrouped for greater convenience, and spring boosters are said to reduce level pull by as much as 25 per cent. All-weather starting is now standard equipment on this model.

For further information write to the International Harvester Co., 180 N. Michigan Ave., Chicago 1, Ill., or use the Request Card at page 18. Circle No. 132.

### Major highway bond issues considered by seven states

A total of \$1,630,000,000 in credit highway financing is being considered in seven states this year so that highway construction programs can be either continued or accelerated.

Issuance of \$10 million in bonds has already been authorized in West Virginia for state highways. A similar amount, approved by the Mississippi senate, would bring gas tax revenue bonds to \$85 million for state highways. Pennsylvania is considering two bills that would provide more money for highways. One would authorize additional bonds, the other would increase the borrowing power of the State Highway and Bridge Authority by \$60 million.

In Kentucky, the legislature has passed a bill authorizing issuance of \$100 million in bonds for federal-aid matching purposes.

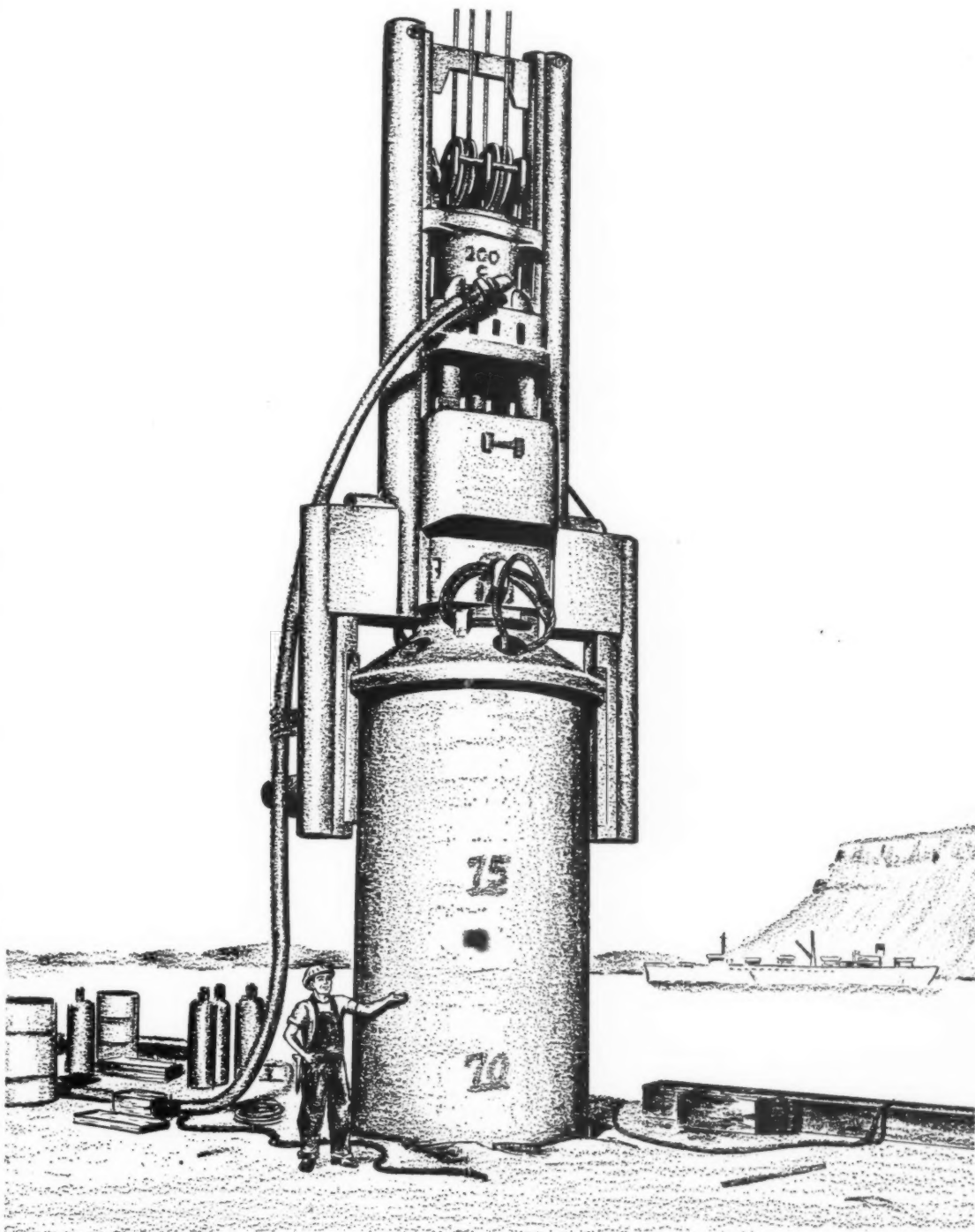
A New Jersey bill, subject to approval by voters in November, proposes a \$750 million bond issue for a 10-year improvement program for state, county, and urban roads. New York's legislature has approved a bill authorizing \$500 million for state highways and parkways. This also is subject to approval by voters. And a bill introduced in Massachusetts would authorize \$200 million in bonds to continue the accelerated highway program. This would make a total of \$750 million in bonds authorized for the state's road program since 1949.

### Power development opens

The Roanoke Rapids development, consisting of a power station with four 35,000-hp turbines that will provide an additional 100,000 kilowatts to this North Carolina-Virginia area, went into operation last month. The \$32,000,000 facility built for Virginia Electric & Power Co., has a tailrace 1½ miles long, 45 feet deep, and 80 feet wide blasted from solid rock.



THE JOB of getting equipment to a virtually inaccessible site in the Rocky Mountains, 7,000 feet above sea level, is handled easily for the project by a helicopter. A Le Roi 150-cfm portable air compressor needed at the spot was first dismantled, then flown piece by piece to the site, where it was reassembled.



The Largest Pile Driving Hammer in the world, owned and operated by the DeLong Corp. The giant 200 C Super-Vulcan, driving 6 Ft. Diam., 100 Ft. long caissons into place for support of the new and revolutionary DeLong Dock at Thule, Greenland.

**VULCAN IRON WORKS INC. CHICAGO, U.S.A.**

For more facts, use Reader-Reply Card opposite page 18 and circle No. 221



Two Cleveland drills, mounted on a Caterpillar D6 tractor and using 2½-inch Brunner & Lay Rok-Bits, put down 6-foot drill holes in the 1,200 × 110-foot lock. Altogether, 160,000 yards of rock was excavated for the facility.

C&E Staff Photos



Rock between the drill holes is broken by a Joy 16-foot quarry bar equipped with a broaching bar. The wall line was first close-drilled, then broached to remove 6 feet of rock.

(Additional photo on front cover)

# Traveling steel forms speed lock construction

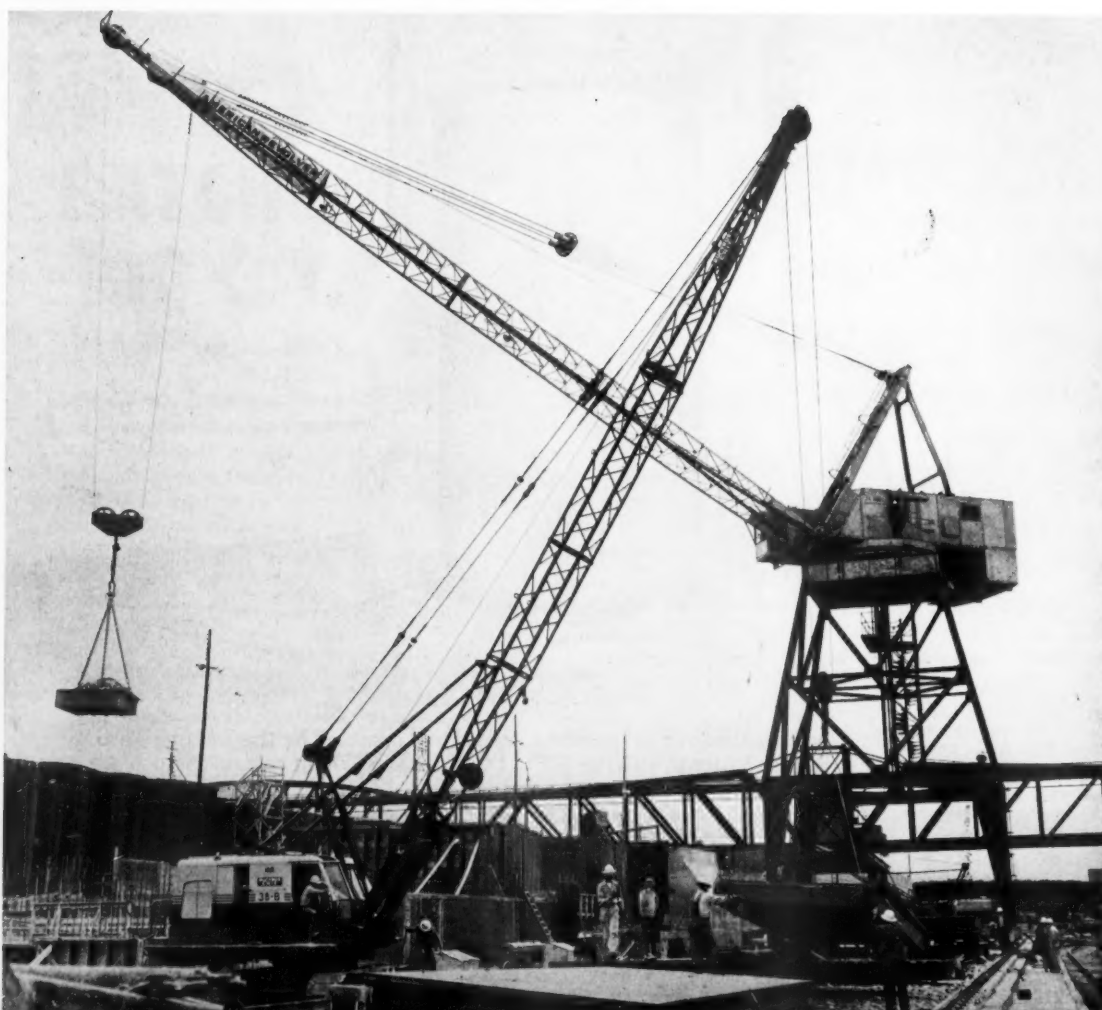
**Contractor places 1,200 cubic yards of concrete  
every day for \$10 million Mississippi River lock**

by RALPH MONSON, field editor

The fast rate of concrete placement on the new \$10 million lock No. 19 on the Mississippi River at Keokuk, Iowa—a rate of 1,200 cubic yards per day—is largely due to a novel set of traveling steel forms that are being used for the first time on this project.

Designed by Records & Stephens Co., San Antonio, Texas, the firm that designed the cantilever forms for Table Rock Dam, (see "Hinged Cantilever Forms Permit High Lifts on Table Rock Dam", C&E, April, 1956, pg. 80) the forms can be stripped, moved, and reset easily, giving the concrete operation the smoothness and speed needed to achieve high production.

The forms, 30 feet long and as high as the lift to be poured, consist of two side forms and a bulkhead. Jacks are used to lift and tilt a form so that it can clear dowels and reinforcing as it moves ahead to a new position on rails. As soon as the first lift is completed, the form moves to a new position for another first lift. As it moves ahead, the form for the second lift is



The American R-20 revolver swings a bucket of rock out of one of the excavations as a Bucyrus-Erie 38-B crane handles steel and wood form panels for footing pours.

The crane, reaching all parts of the lock with its 125-foot boom, picks up a concrete bucket and swings it to a footing pour.





The form rides on 30-pound rails, which are welded to MP-101 15-inch sheet pile sections for rigidity. As the form is jacked up, the rails are blocked into position and the wheels of the form lowered to engage the rails.



set in place for a higher pour on the big lock.

#### Larger facility required

The 110-foot-wide and 1,200-foot-long lock, started in the spring of 1953, is scheduled to be ready for use by March, 1957, although it will not be completed until midsummer of that year. Being built for and under the supervision of the Rock Island District of the U. S. Army Corps of Engineers, it will replace one of the oldest locks on the upper Mississippi.

Around 1870, a canal constructed around the Des Moines rapids at the location of the present lock and dam had three locks, one of which was located within the area enclosed by the lock now being built. More than 10,000 cubic yards of masonry had to be removed from this abandoned lock during excavation for the new structure.

This old canal was abandoned when the present dam was constructed as a power-development project, and a 358-foot lock built in 1912 and 1913.

This served river traffic for more than 40 years. The increasing traffic of the last decade, and the larger tows made possible by more powerful towboats, increased the number of delays at the lock as tows were split and passed through. The new structure being built, three times the length of the lock built just prior to World War I, is expected to eliminate this bottleneck. It will permit practically all tows to be locked through in a single operation.

At the upstream end, the lock will be fitted with two gates, a guard gate and the operating gate, which will serve as vertical lift gates. A single miter gate will be located at the lower end of the lock. Guide walls are also located at the downstream approach to the lock.

Two of the three sets of discharge channels carrying water from the lock to the river channel across the lower approach channel of the existing lock were completed during the winter of 1955-56. This work did not interfere with river navigation, since

the river is closed to traffic during the winter months. Completion of this work permitted the lower approach channel to the old lock to be opened before the navigation season began this spring. Right now, concrete placement is moving ahead rapidly to complete the lock walls this spring, so that gates, machinery, and equipment can be installed as rapidly as possible.

#### Cofferdam built in Stage I

The \$1.6 million Stage I contract for the lock covered construction of a cellular cofferdam beginning 250 feet above the Keokuk Bridge and extending some 500 feet downstream to enclose the construction area. The swing span pier of the bridge was included in this area. McCarthy Improvement Co., Davenport, Iowa, handled this job, together with about 23,000 cubic yards of concrete work included in the contract.

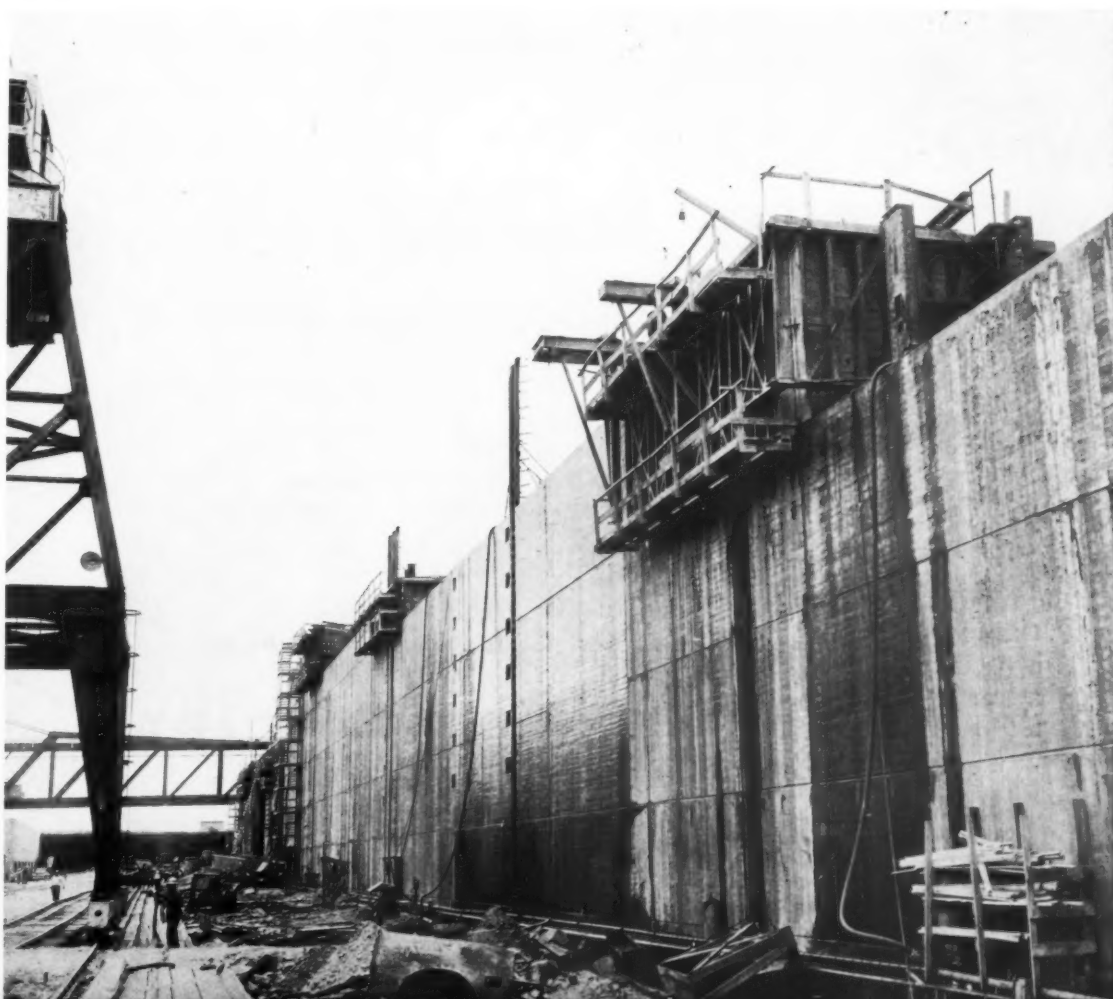
Stage II, which accounts for just under \$8 million of the construction cost of the facility, is being built by

J. A. Jones Construction Co., Inc., Charlotte, N. C. The firm moved onto the job in the summer of 1954, and after completing the cofferdam around the work area, began the excavation and started assembling the concrete plant and other needed facilities.

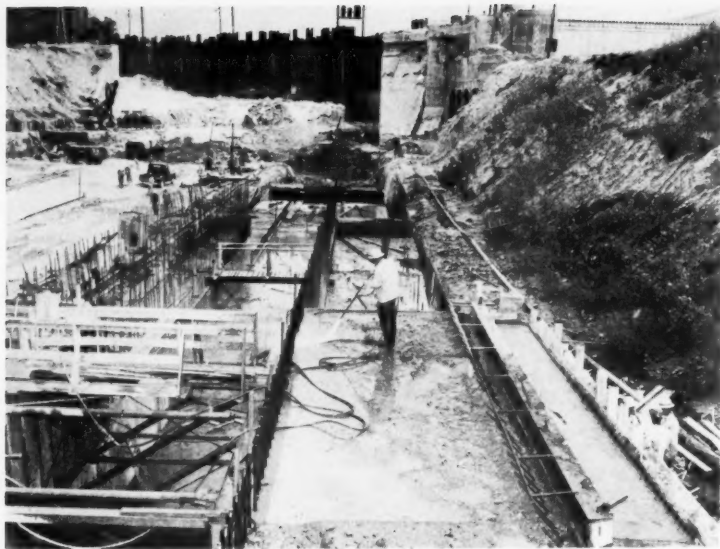
The 300,000 cubic yards of common excavation were sublet to H. N. Rodgers & Sons Co., Memphis, Tenn., which used a Lima dragline and a Northwest shovel, together with spreads of bottom-dump and end-dump Euclids to handle the material. The excavated material was used to develop a mile of river bank below the lock, making it suitable for future commercial development.

#### Drilling and broaching

Excavation of the 160,000 cubic yards of solid rock proved to be a difficult and time-consuming operation, because it was necessary to retain the rock banks of the excavation in an undisturbed condition. In places where the concrete of the lock walls



The traveling forms, 30 feet long, 10 or 12 feet high, and designed for a particular lift, are in place for successive pours. The day after a pour, the side forms are moved out, the bulkhead moved up and out, and the entire form raised to clear the steel before it is rolled ahead on rails.



(Continued from preceding page)

had to be poured against the rock, it was necessary to line drill the outline of the excavation. In most cases, broaching was also required.

The line drilling and broaching were done with standard quarrying equipment, including three Joy quarry bars 16 feet long. Once these bars were set up to line and grade, their drills were able to line-drill the series

Four hours after concrete is placed, the surface of the lift is "green cut" with a high-pressure water spray to remove laitance and expose the aggregate so that a good bond will be formed with the next lift.

of holes quickly and accurately. Brunner & Lay carbide-tipped Rok-Bits were used to drill the 2¼-inch holes on about 3½ inch centers. Quarry broaching bars in the slugger hammers then broke out the rock between the holes, separating rock to be removed from the wall that was to remain.

Most of the broaching was carried about 7 feet deep, although most of the drilling went much deeper. The contract included 96,000 square feet of rock face that had to be drilled and broached. Since the lock had to replace a portion of the old dam, this concrete structure had to be cut in the same manner.

Shot holes for the rock excavation were made by Ingersoll-Rand and Cleveland wagon drills, and by a pair of Cleveland drills mounted on adjustable arms on the front of a Caterpillar D6 tractor. All of the drilling equipment was supplied with air by 4-inch pipelines running the full length of both lock walls from a central compression station. Two Joy 1,650-cfm compressors powered by electric motors, supplied the air for this operation.

After holes had been loaded and shot with Du Pont 40 per cent special gelatin, a Northwest shovel was used to load the broken rock to a fleet of Euclids hauling to disposal areas. Some of the rock excavation, put through a Cedarapids two-stage portable crusher and reduced to 2-inch minus size, was used to fill the cells of the cofferdam built on the upstream side of the dam.

#### Upstream cofferdam

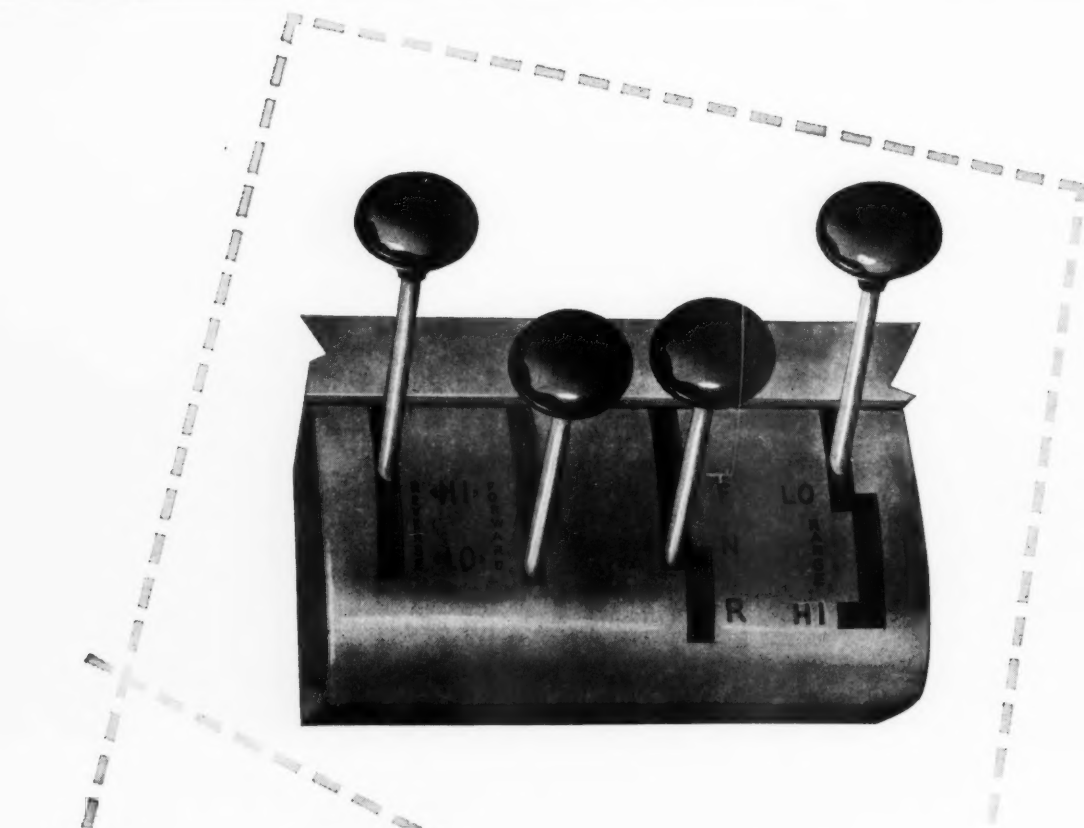
The cofferdam, built in the pool above the dam to permit part of the old dam to be removed, was part of the Stage II contract. This cofferdam consisted of a series of sheet-pile cells, 52 feet in diameter and 50 feet high, constructed in 44 feet of water. These cells were formed around a floating template that could be made submersible.

Fabricated in the job shop and assembled at the site, the template had a frame made of angles and it carried six flotation tanks, each 4 feet in diameter and 6 feet long. When the tanks were full of air, the template was buoyant and could be set in exact position. Six pipe spuds, 10 inches in diameter and 52 feet long, were then set into the 12-inch pipe spudwells of the template to hold the unit in alignment. As water was admitted into the tanks, the template sank, while cables on the spuds controlled the depth to which it went.

After 50-foot MP-101 sheet pile sections had been driven around the template to form the cell, water was blown out of the flotation tanks by air and the template rose to the surface.

As each cell was completed with this process, it was filled with crushed rock obtained from the lock excavation.

During the years that the old dam had been in place, silt up to 25 feet deep had accumulated on the upstream side. Scrap and debris had also collected with the silt, forming a



## Without clutch these controls\* shift Huber-Warco Motor Graders

Combination of a torque converter and power-shift transmission on Huber-Warco motor graders, permits quick, effortless shifts under full load, **WITHOUT CLUTCH**. Efficiency is increased, operator fatigue is reduced, thereby making possible greater workload capacity.

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For more facts, use Reader-Reply Card opposite page 18 and circle No. 222



conglomerate difficult to excavate. Jones removed some 35,000 cubic yards of this material with a P&H 1055LC crane and a 2½-yard clamshell.

When the upstream cofferdam had been completed and the area between it and the old dam dewatered and cleared of silt and debris, the old concrete section was breached. Line drilling and broaching were used to provide a complete separation of the portion to be removed, then the position was drilled, blasted, and removed with rock excavation methods.

#### Gantry crane places concrete

As soon as the first of the rock excavation had been carried down to grade, work began on the concrete substructures for the lock. All concrete for the lock was produced in a big Johnson concrete plant, set up in the lower end of the lock excavation so that concrete could be discharged into buckets carried by flatcars at the grade of the lock floor.

Practically all of the concrete for the lock was handled in Johnson 4-yard concrete buckets by an American R-20 revolver with 125 feet of boom. The big crane was mounted on a 60-foot gantry that traveled the full length of the lock floor, straddling the track used by the cars hauling concrete.

The day shift usually sets the forms, places the reinforcing steel, and makes preparations for placing the concrete, while the night shifts place the mass pours. Johnson and Dravo 2-yard buckets and Blaw-Knox 1-yard buckets are used by the smaller cranes making the smaller pours. Bucyrus-Erie 54-B, a 38-B, and a 22-B transit crane, together with a P&H 555TC truck-crane, not only assist with the pours but also help with forming and setting steel. The buckets used for the smaller pours have hand-operated gates, while the 4-yard buckets are fitted with air-operated gates. Mass-pour concrete is consolidated with Malan 3½-hp air vibrators, though some of the very thin sections are vibrated with Mall electric units.

#### Traveling steel forms

The main sections of the lock walls above the footings are cast in the series of forms designed by Records & Stephens Co., San Antonio, Texas, and fabricated by Mosher Steel Co., Houston, Texas.

Each of the lock walls is being cast in 8 lifts, ranging from 6 to 12 feet in height. The walls between the gate blocks are 38 to 44 feet thick at their widest part and taper to 6½ feet at the top. The front faces are vertical; all the batter is in the back faces. A separate form section is used to cast each of the first 6 lifts on each of the lock walls. The forms for the top two lifts are smaller, permitting the same two sets to be used for both walls. These are transferred back and forth, as required, by the crane.

Three of the six lower lifts are being made with a unique self-moving form. Each of these traveling forms is 30 feet long and the height of the lift to be poured. It consists of two

side forms and a bulkhead made of steel framing and lined with horizontal wood lagging. The sides and end are held in place by heavy steel beams and angle braces. When the forms are in pouring position, their bottom edges are tied to the concrete below with anchor bolts.

Forms are left in place a minimum of 24 hours after concrete is placed. Then bottom anchor bolts are removed and corner ties loosened. By means of self-contained jacking devices, the side forms are moved outward about two inches. Buda jacks built into the bulkhead end of the form raise this section 36 inches above

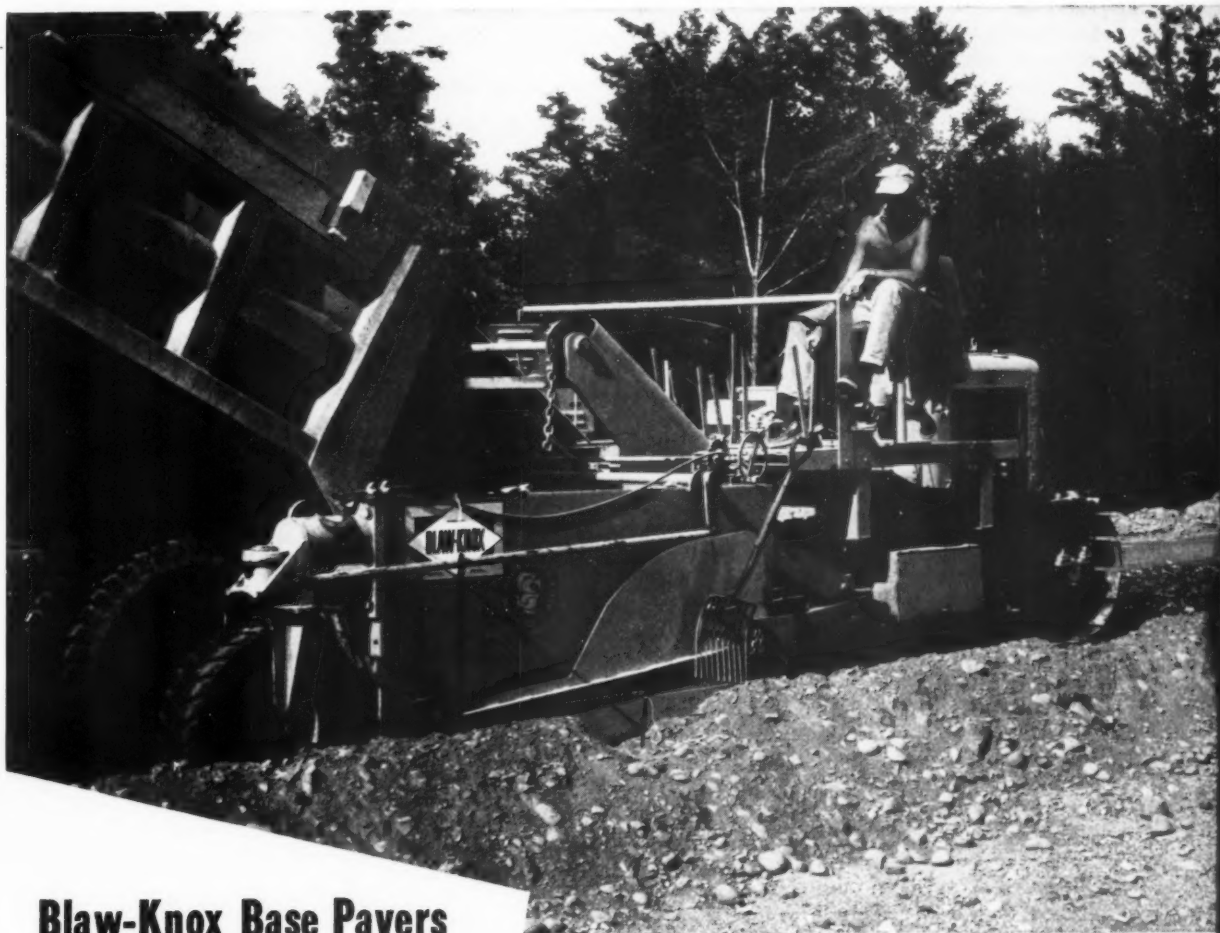
its usual position, causing the entire form to tilt so that the bulkhead clears reinforcing dowels and other embedded metals as it moves ahead.

#### Forms ride rails

Sections of 30-pound 33-foot-long steel rail, laid on the newly poured concrete block, engage a pair of flanged wheels on the crossbeam of the forms. A similar pair of rails, laid ahead of the form on the previous lift, engage two wheels on the bulkhead. Each of these rails is welded to a section of MP-101 15-inch sheet piling as long as the rail. This gives the rail bearing and stability, so that

each section of the rail only has to be blocked to line and grade with wood blocking.

When an air winch has pulled the form ahead to its new position, the bulkhead is lowered to correct grades and alignment, the sides are jacked in, corner ties secured, and anchor bolts inserted at the bottom of the side panels. The bottom of the bulkhead is secured by kicking it up against a 6-inch lip that is left on the construction joint between the monoliths, and using trench jacks bearing against pipes set in vertical holes in the concrete of adjacent monoliths. When the gantry crane is



## Blaw-Knox Base Pavers used exclusively on **63 MILES** of Maine Turnpike 4-Lane Extension



spread up to 400 tons per hour of base material

All of the paving on the 63-mile, 4-lane Maine Turnpike was laid over base material spread by Blaw-Knox Base Pavers.

These high capacity Model P-150 Base Pavers were used by both major paving contractors to spread the base material to a 4-inch depth on the two 24-foot wide strips on this job.

The big capacity of the Model P-150 keeps any paving job rolling. Oscillating V-type screed assures "straightedge" leveling of large stone, slag, gravel, soil cement or crusher run aggregate to close specification *without segregation*. Oscillating action tends to knit adjacent courses eliminating uneven joints and the need for hand leveling. It will lay base material up to 16 feet wide and up to 20 inches deep and is easily adjusted for crown and superelevated curves. The 21-inch tracks provide ample traction for pushing loaded trucks in soft material without disturbing the base material.

**BLAW-KNOX COMPANY, Mattoon, Illinois**  
Construction Equipment Division  
40 Charleston Avenue

For more facts, circle No. 223→

available, it raises and moves the form, doing away with the need for the jacks and air hoist.

This procedure makes it possible for each of the forms to move from pour to pour, placing a complete lift as they work themselves from one end of the lock to the other. As soon as the form for the first lift has advanced far enough, the second-lift form is set in place. Forms for successive lifts go into this lineup as pouring advances.

#### Other forms

A 5x8-foot-high gallery in each of the lock walls was poured with a more conventional traveling form. These retract from the top and sides and move ahead on rails set on the gallery floor. Unlike the outer forms, which use tongue-and-groove lumber, these forms have steel faces.

The traveling forms were not adapted to a number of irregular sections built at the downstream end of the lock. These were constructed with some Blaw-Knox cantilever forms, built for use on Wolf Creek Dam in Kentucky in 1946, and thought to be some of the first steel cantilever forms produced by Blaw-Knox. Originally designed for 5-foot lifts, they were converted to 10-foot-lift forms for this job.

They were tied to the previous pour with 1 1/4-inch Superior screw anchors, and tied across or down with Superior 1-inch coil ties. Some of these forms were built up to 12.75 feet. An additional Superior 1/2-inch tie was added to take care of the extra buildup. These forms were also lined with 2-inch matched lumber.

Within 2 to 6 hours after a pour, the surface of the concrete was "green cut" with a high-pressure water spray to remove the laitance and expose some of the surface aggregate. This left the surface in good condition to bond to the next lift.

Concrete was cured a minimum of 14 days with water, which was applied by a variety of methods. Rain-bird sprinklers of the type used for irrigation applied water to the surface of some of the larger areas of concrete. Water was sprayed over smaller surfaces by perforated pipe or lawn-type perforated hoses. Since there were water mains laid the full length of both lock walls, it was convenient to attach sprayers as the work moved along.

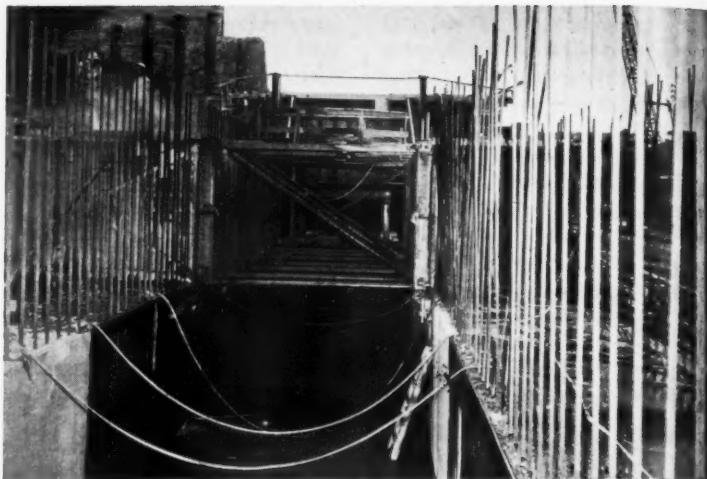
Concrete placement in the heavy wall sections continued throughout last fall, as long as weather permitted pouring and curing to be done without the need for excessive heating. When cold weather stopped work on the main lock walls, the crews switched to construction of the discharge laterals across the present navigation channel below the old lock.

A cofferdam consisting of 13 sheet pile cells, 32 feet in diameter and 30 feet high, closed off the channel below the old lock so that a trench could be excavated in the rock bottom to carry the discharged tunnels across the navigation channel and out to the river. These eight discharge channels, 8.5 feet wide, 7.5 feet high,

and 110 feet long, have 18-inch concrete walls and are equipped with baffles and ports to dissipate the velocity of the escaping water.

During this work, a Littleford 100-hp steam generator was used to provide live steam to heat the concrete aggregates and mixing water. Live steam was also introduced inside the tunnels through perforated pipes after concrete was placed. Steam heat was also supplied under the tarpaulins covering the pours. The toughest heating problem this past winter was that of keeping the 1 1/2-inch and 3-inch aggregate piles from freezing. Cold seems to penetrate to the core of these piles, freezing even the gates, unless heat is generously applied.

Supervising the project for J. A.



Special retractable steel forms are used to form tunnels in the lock wall so that water can be discharged from the lock, lowering boats 38 feet under normal river conditions.

# NOW! The lowest-priced T

**Miles of extra life, with extra-strong chassis features! Up to 3000 lbs. more payload than other 6-wheelers!**

• Ford's new T-800 is the lowest-priced in its class—based on a comparison of manufacturers' suggested list prices. It also carries up to 3000 more lbs. of payload compared to other tandems in the same GVW weight class!

#### With a new combination of Safety Features available only in Ford Trucks

Deep-center Lifeguard steering wheel helps protect driver from steering post, in case of accident.

Double-grip Lifeguard door latches give added protection against doors flying open on impact.

New blowout-resistant tubeless tires—standard on all models. Ford seat belts at low extra cost.

Rugged truck foundation from deep-channel frames, among the strongest on any trucks.

No lubrication needed—rubber-bushed equalizing beams and torque arms.

Cut steering effort up to 75% with Master-Guide Power Steering. Standard equipment on T-800 models.

New wide choice of transmissions—all Synchro-Silent type.

Large-capacity flat tube fin radiator gives high cooling efficiency.

Long lasting Gyro-Grip clutch with low pedal pressure.

Easy-action front springs with double-wrapped rear eyes for added safety.

Spring-loaded tie rod ends take up wear automatically.

Faster starts, longer life with new 12-volt electrical system.

Greater economy, freer rolling, from third (inter-axle) differential in power divider.

33% longer rear brake life with new thicker linings.

**NEW FORD T-800 CHASSIS SHOWN**  
Max. GVW: 42,000 lbs., GCW: 65,000 lbs.  
Axle ratings: Front 9,000 lbs. (11,000 lb. axle available)  
Tandem rear: 34,000 lbs. (17,000 each axle)  
Payload: up to 32,160 lbs.  
Wheelbases: 144, 156, 175, 192 inches.

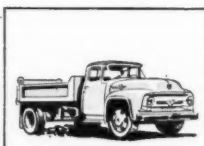
## Every major body builder builds for Ford...



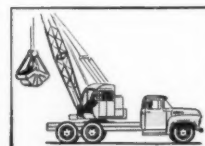
CEMENT MIXER TRUCK



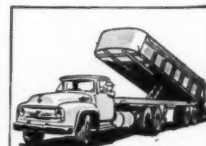
DUMP TRUCK



DUMP WITH SCRAPER



TRUCK-MOUNTED CRANE



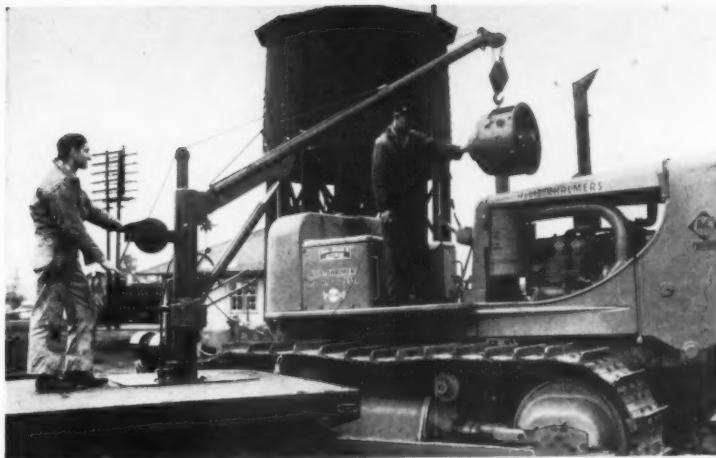
TRAILERIZED DUMP



Jones Construction Co. is a staff headed by project manager J. C. Petern, and including project engineer R. B. Wells, field superintendent E. J. Waters, carpenter superintendent C. A. Cruse, ironworker superintendent Ike Heaton, labor superintendent Doc K. Poe, equipment superintendent W. R. Kap, and electrical and piping superintendent R. A. Kabrick.

Resident engineer for the Rock Island District of the Corps of Engineers is Norman E. Allen. He is assisted by assistant resident engineer H. R. Hatcher and concrete technician Ed. A. T. Spuehler. The district engineer for the Rock Island District is Col. John L. Wilson, Jr. THE END

(A companion article appears on page 36)



Workman on Allis-Chalmers tractor holds remote-control switch for Cam Blue Heron crane in right hand as he guides motor component into place with left hand.

### Crane can be electrified, remote-control operated

■ A mobile crane that can be operated hydraulically, electrically, and by remote control is available from the Cam Tool Co. The heavy-duty truck-mounted rig is known as the Cam Blue Heron crane.

The standard version is a combination of a two-speed hand-operated rotating winch and a double-acting hand hydraulic pump. The pump can be electrified and operated by remote control with a solenoid switch. The boom can handle loads up to 2 tons, and a special by-pass safety valve prevents possible overloading of the unit.

With the boom in a horizontal position, the over-all height of the crane, measured from the truck bed, is 5½ feet. Boom overhang is 6 feet in the collapsed position and 9 feet in the extended position. The heavy-duty tackle block takes a five-part line of ½-inch plow-steel wire rope.

For further information write to the Cam Tool Co., 11 Randwick Ave., Oakland, Calif., or use the Request Card that is bound in at page 18. Circle No. 166.

### Asphalt Institute studies cost-reducing techniques

Research engineers at the Asphalt Institute, College Park, Md., are speculating on the possibility of further reducing the cost of heavy-duty asphalt highways. A long-range investigation of asphalt-mix design, the studies indicate that a 15 per cent reduction in the amount of relatively expensive coarse aggregates in an asphalt-paving mix may be possible without losing any paving strength.

Far from conclusive, the investigation is limited to a complete cycle of tests employing the Marshall method.

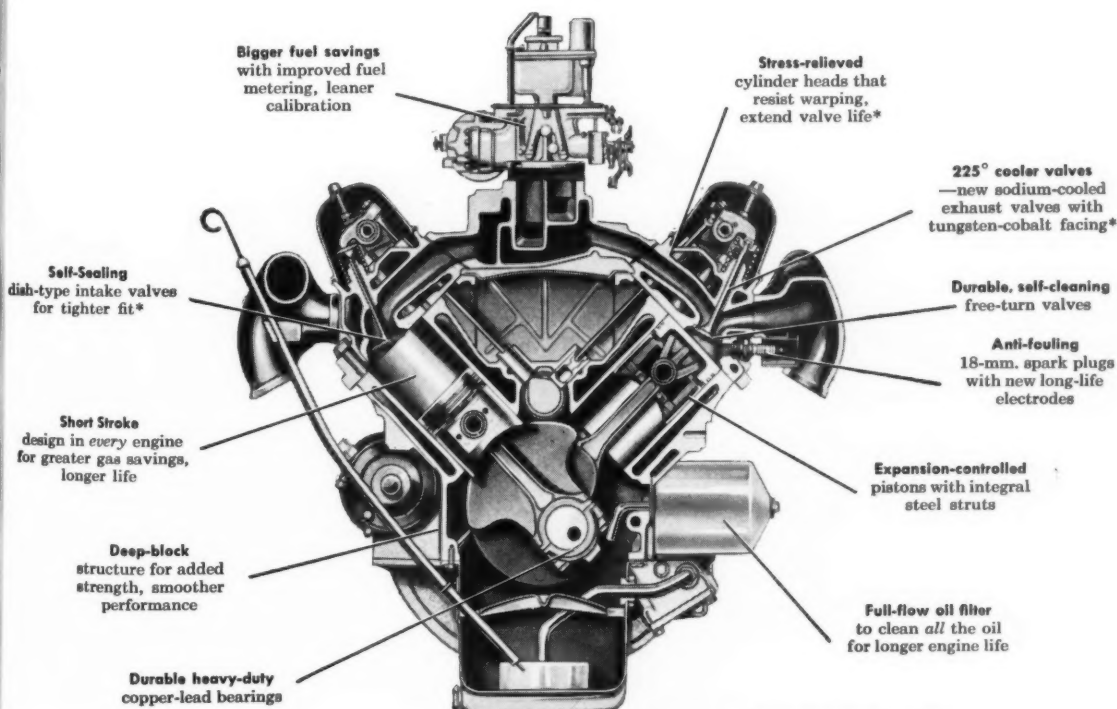
### Port Authority officers

The Port of New York Authority has re-elected Donald V. Lowe as chairman. At the same time, Howard S. Cullman was re-elected honorary chairman. The 12-man board of commissioners re-elected Eugene F. Moran as vice chairman. General counsel Sidney Goldstein and executive director Austin Tobin were also re-elected.

## ed Tandem in its class-Ford T-800

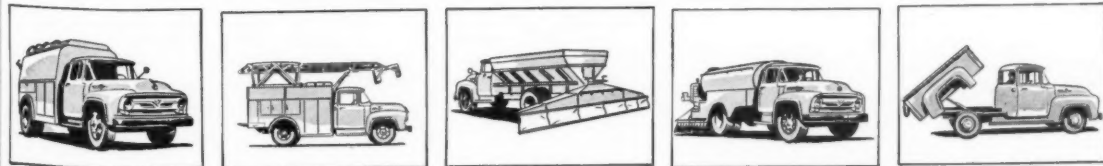
**Longer-lived, dependable operation with exclusive heavy-duty engine features**

● '56 Ford Tandems offer you the most proven Short Stroke V-8 engines in the industry—for better gas mileage, longer life, less maintenance costs. And you get a combination of longer-lasting heavy-duty engine advancements found in no other truck. Ask your Ford Dealer for details.



\*Features of new Ford Heavy Duty engines . . . 190-h.p. Torque King V-8 shown . . . 200-h.p. Torque King Special V-8 available.

## More fleets are buying Fords than any other make



UTILITY TRUCK

LINE TRUCK

LIME SPREADER

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LIGHT DUTY DUMP

For more facts, use Reader-Reply Card opposite page 18 and circle No. 224



Pulled by Caterpillar DW21 tractors, Movalls make about six trips per hour on this turnpike grading job. Haul lengths vary from 3,000 to 3,500 feet on a round trip.

### High earthmoving output is attained on turnpike

Earthmoving operations on the 5-mile-long section of the Massachusetts Turnpike near Warren, Mass., involves moving 500,000 yards of rock and 2,225,000 yards of earth. A. J. Orlando Construction Co., contractor on the job, used C&D Movalls powered by Caterpillar DW21 tractors to

handle loads made up of about  $\frac{2}{3}$  solid rock and  $\frac{1}{3}$  combination of dirt and rock.

Because of the very cold weather, some of the material froze in the wagons, but, in spite of the freezing conditions, there was little trouble in ditching the load. Frozen and sticky material was wiped out of the body by the Movall's dozer-type ejector



Dirt and rock are dumped from the body of a C&D Movall, and a dozer-type ejector with a 140,000-pound push wiped frozen and sticky material out of the unit's body, preventing a buildup of material.

with 140,000-pound push. This prevented the buildup of material.

Loaded by a Bucyrus-Erie 2-yard shovel making about 10 swings per load, the Movalls average about six trips per hour over soft, muddy ground. Payload in solid rock is about 15 cubic yards, and in rock and dirt, about 18 cubic yards.

The Cat DW21's operated in areas of limited access and maneuvered well on rough terrain.

### Curing compound

■ Protex curing compound, manufactured by Autolene Lubricants Co., is the subject of new literature. The three types of compounds described are white pigmented, clear, and tilt-up. According to the folder, Protex meets the specifications of such groups as the U. S. Army Corps of Engineers, the AASHTO, and the ASTM. On-the-job photos show the compound applied to cement with automatic, hand, and power sprayers.

To obtain this folder write to Autolene Lubricants Co., 1331 W. Evans Ave., Denver, Colo., or use the Request Card at page 18. Circle No. 87.

### Manual on drilling

A new handbook, "Basic Procedures of Diamond and Shot Core Drilling," discusses such subjects as setting up the core drill, driving the casing, diamond-core drilling, and shot-core drilling. Hints for successful drilling are also given.

Written in nontechnical language, the manual is liberally illustrated.

Priced at \$1, the book is available through its publisher, the Aker Drill Co., Inc., Scranton, Pa.

## THE JOB: straighten a road, build bridge approaches AND MOVE A RIVER!



This CAT\* No. 12 Motor Grader is helping cut out a new channel for the Iowa River near Marshalltown.

It's part of a project which called for straightening curves in a county road, building approaches to a bridge, and diverting a meandering river beneath its new span. The length of road involved was only 0.8 of a mile, but Mickle and Ross Construction Co., of Newton, Iowa, moved nearly 100,000 cu. yd. of dirt.

Foreman Virgil E. Reynolds had a fleet of 11 Caterpillar machines on the job. "We don't have an off-breed in the outfit," he said.

Working close to water like this is tough going. The No. 12 had to maneuver in mushy, sandy loam. "Occasionally machines hit silt pockets and nearly dropped out of sight," Supt. Reynolds said, "but I never worry when I've got the right equipment... and I've got the right equipment."

The No. 12 is "the right equipment" for contractors all over the country—for four big reasons. Costs less

to maintain. Costs less to operate. Produces more. Lasts longer.

Your dealer would like a chance to back up each one of these claims with specific details. The exclusive Caterpillar oil clutch, for instance, that gives up to 1500 hours' service without adjustment. And the new tubeless tires (now standard equipment) that can eliminate 80% of the down time caused by tires.

Let your Caterpillar Dealer demonstrate the dozens of other features that make the No. 12 the high-producing, cost-cutting motor grader it is.

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

# CATERPILLAR\*

\*Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

**99% OF ALL CAT MOTOR GRADERS EVER BUILT ARE STILL ON THE JOB**

For more facts, use Reader-Reply Card opposite page 18 and circle No. 225



## Convention calendar

### May 14-15 Society of American Military Engineers

Meeting, Army Engineer Center, The Engineer School, Engineer Research and Development Laboratories, Fort Belvoir, Va. Society of American Military Engineers, 808 Mills Bldg., Washington 6, D. C.

### May 17-19 New York State Society of Professional Engineers

Convention and 30th Annual Engineering Industries Exposition, Hotel Statler, New York, N. Y. Harold Becher, P. E., chairman of publicity committee, NYSSPE, 1941 Grand Central Terminal, New York 17, N. Y.

### May 20-22 Building Research Institute

Annual Meeting, Sheraton-Brock Hotel, Niagara Falls, Ontario, Canada. William H. Scheick, executive director, National Academy of Sciences, 2101 Constitution Ave. N. W., Washington 25, D. C.

### May 21-24 Pan American Convention of International Road Federation

Convention, San Salvador, El Salvador, C. A. Robert O. Swain, executive director, Pan American Convention, IRF, 1023 Washington Bldg., Washington, D. C.

### May 23-26 National Society of Professional Engineers

Meeting, Ambassador Hotel, Atlantic City, N. J. Kenneth E. Trombley, NSPE, 2029 K St. N. W., Washington 6, D. C.

### May 28-30 Wire Reinforcement Institute, Inc.

Meeting, Greenbrier Hotel, White Sulphur Springs, W. Va. Frank B. Brown, managing director, WRI, 1049 National Press Bldg., Washington, D. C.

### May 28-June 2 Concrete Reinforcing Steel Institute

Annual Meeting, Greenbrier Hotel, White Sulphur Springs, W. Va. H. C. Delzell, managing director, CRSI, 38 S. Dearborn St., Chicago 3, Ill.

### June 4-8 American Society of Civil Engineers

Meeting, University of Tennessee, Knoxville, Tenn. Don H. Mattern, general chairman, ASCE, 513 Union Bldg., Knoxville.

### June 5-8 Material Handling Institute

MHI 1956 Exposition, Public Auditorium, Cleveland, Ohio. Robert T. Scott, public relations director, MHI, Suite 759, 1 Gateway Center, Pittsburgh 22, Pa.

### June 17-22 American Society for Testing Materials

Fifty-ninth Annual Meeting and 12th Apparatus Exhibit, Chalfonte-Haddon Hall, Atlantic City, N. J. Fred F. Van Atta, assistant secretary, ASTM, 1916 Race Street, Philadelphia, Pa.

### June 18-20 School for Highway Superintendents

Course of Instruction, Cornell University, Ithaca, N. Y. Professor J. W. Spencer, highway research and extension engineer, Department of Engineering, Cornell University.

### June 24-26 American Society of Landscape Architects

Fifty-seventh Annual Meeting, Hotel Cleveland, Cleveland, Ohio. Ernest L. Dewald, general chairman, ASLA, 12910 Fairhill Road, Shaker Heights 20, Ohio.

### June 25-29 American Society for Engineering Education

Meeting, Iowa State College, Ames, Iowa. W. Leighton Collins, secretary, ASEE, University of Illinois, Urbana, Ill.

### July 22-25 National Association of County Officials

Twentieth Annual Conference, Hotel Utah, Salt Lake City, Utah. Keith L. Seegmiller, executive secretary, NACO, 1616 Eye St. N. W., Washington, D. C.

Wooden timbers of the Mayflower, the ship that brought over the Pilgrims in 1620, are still in service. After the ship was dismantled its ribs were re-used in a British building which still stands.

MAY, 1956

## Congress authorizes work on Great Lakes channels

A project to deepen the connecting channels of the Great Lakes to a uniform depth of 27 feet has been authorized by Congress. Work will be done under the supervision of the U. S. Army Corps of Engineers.

Existing controlling channel depths are 25 feet for downbound traffic and 21 feet for upbound traffic. When the project is completed, the channel depths will be comparable to those that will be provided on the St. Lawrence Seaway, now under construction.

Costing an estimated \$110,300,000, the work will be done on the St. Marys River, the Straits of Mackinac, St. Clair River, and the Detroit River.



## CARDOX Announces

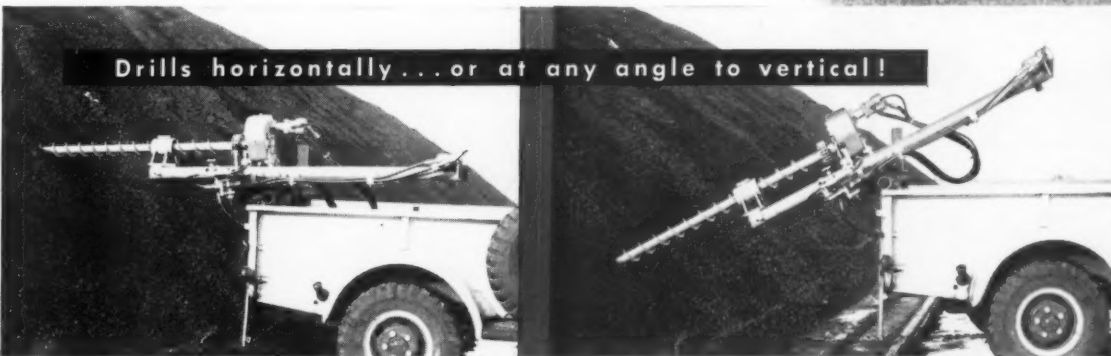
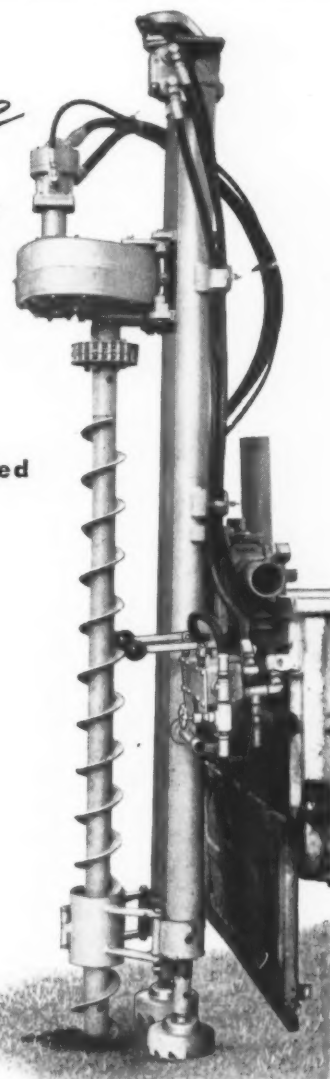
# NEW

## TRUCK-MOUNTABLE\* GENERAL PURPOSE drill

- Hydraulic-powered • Hydraulic-controlled
- Auger sizes from 3 to 12 in.
- Drills vertically, horizontally or at any angle in between

Mobility pays off when power, speed and rugged construction are not sacrificed. The CARDOX general purpose drill gives you these features and more. It adds control such as is seldom found outside machine shops. Can drill at any fore-and-aft or lateral angle from horizontal to vertical with equal power and speed.

\*Mounts on any flat-bed truck, crawler or farm-type tractor, or any other mobile equipment with a power take-off to drive its hydraulic system. NOTE: Can also be dismounted for use as a trench drill or horizontal drilling on different levels. Maximum feed rate: 20 fpm. Write for complete details.



### CARDOX CORPORATION

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Library, Pennsylvania  
Box 427  
Phone: Library Colonial 3-6910  
Camden-on-Gauley, W. Va.  
Phone:  
Camden-on-Gauley 2181

Evansville, Indiana  
307 Northwest Fifth St.  
Phone: Evansville 2-8944  
Ottumwa, Iowa  
Phone: Ottumwa  
Murray 4-6564

For more facts, use Reader-Reply Card opposite page 18 and circle No. 226



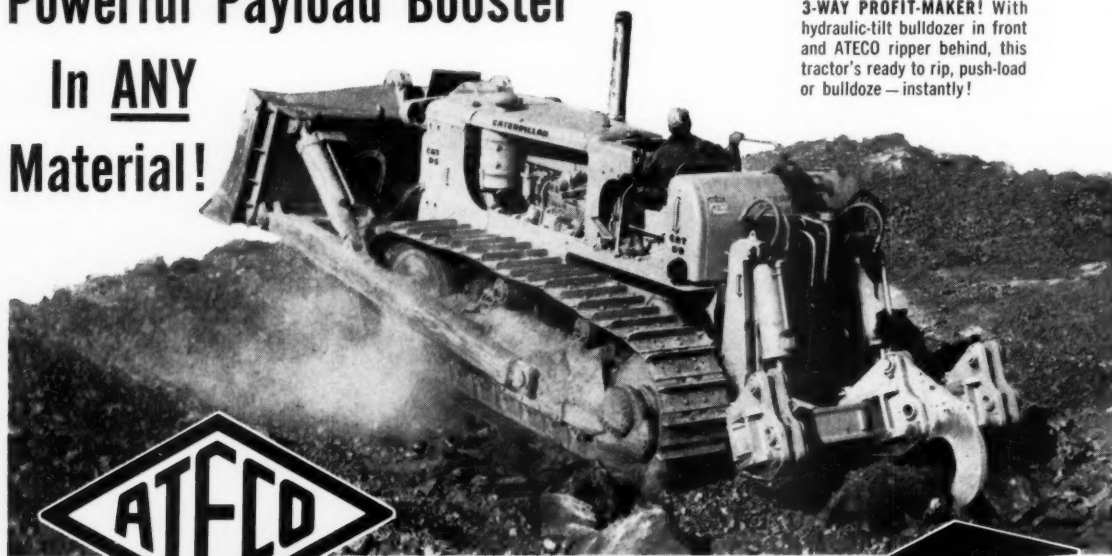
Aggregates barged 125 miles from Linwood, Iowa, to the job site are transferred to stockpiles by this P&H 1055LC crane with an Owen 3-yard clamshell bucket.

C&E Staff Photos

## Batch plant sets the pace for concrete work at lock

**Six aggregate bins have a capacity of 400 tons of material; concrete delivery is made by flatcars carrying 4-yard buckets**

## Powerful Payload Booster In ANY Material!



**3-WAY PROFIT-MAKER!** With hydraulic-tilt bulldozer in front and ATECO ripper behind, this tractor's ready to rip, push-load or bulldoze—instantly!



## ROCK RIPPER for Caterpillar D9, D8, D7 & D6 Tractors

**GET EXTRA-YARDAGE SCRAPER LOADS FASTER...** A pass or two with your ATECO Rock Ripper shatters and loosens packed earth, cemented gravel, hardpan, shale or rock. Your scrapers pick up heaped loads, with a shorter loading cycle that really boosts yardage and cuts costs!

**SAVE SCRAPER DAMAGE AND DOWNTIME...** There's far less strain on scrapers, less heavy push-loading, when you rip first. Saves you plenty in costly scraper repair and downtime!

Available now for Caterpillar D9, D8, D7 and D6 tractors. Thoroughly performance tested on hundreds of jobs by leading contractors. Why lose yardage, time and money with a "half-equipped" CAT?—Make yours a three-way profitmaker with an ATECO Rock Ripper now. See your Caterpillar dealer or write us today for literature, prices.

**TURN COSTLY "SHOOT & SHOVEL" JOBS INTO ECONOMICAL SCRAPER OPERATIONS...** Rugged ATECO Rock Ripper's exclusive curved-shank shattering action rips rock and hard materials you'd formerly have to shoot, shatters 'em into easy-loading scraper condition, fast!



**NO OTHER LIKE IT...** Mounts on tractor, balances dozer weight for increased traction, easier handling. Works anywhere tractor can go. Lifts out of way instantly for bulldozing, push loading. Exclusive curved shanks and rock-splitting points shatter and lift hardest materials. Extra rugged; takes full power of tractor without damage to tractor or ripper!

With the average concrete placement coming to 1,200 cubic yards daily on lock No. 19 on the Mississippi River, concrete production has to be geared to feed the American R-20 revolver handling this work.

The big crane is mounted on a 60-foot gantry that rides on tracks straddling the standard-gage tracks used by the flatcars that deliver the concrete. Two Davenport 10-ton locomotives shuttle the delivery cars, each of which carries three full 4-yard buckets and has room for an empty. As soon as the crane picks off the last full bucket, the flatcar goes back under the huge Johnson concrete plant at the end of the 100 x 1,200-foot lock to pick up another load.

### 400-ton capacity

The six aggregate bins of the plant, having a total capacity of 400 tons of material, are arranged around a central cement bin. The six aggregates being used include four sizes of crushed rock graded from 6 to 3/4-inch, coarse sand, and fine sand.

### Processing aggregates

Crushed rock from the Linwood Stone Products Co., Inc., quarry in Linwood, Iowa, is barged 125 miles to the lock at Keokuk. Coarse sand is shipped by rail from La Grange, Mo., and fine sand is delivered by barge from Dallas City, Ill.

At the site, all the aggregates are transferred to stockpiles by a P&H 1055LC crane with an Owen 3-yard clam. To speed cleanup of the barges, and to eliminate the need for hand work, the P&H sets an Oliver OC-3 tractor with front-end shovel on a partly unloaded barge to clean up all material left by the clam. The tractor pushes the material ahead to the clam until, the barge empty, the crane picks up the tractor and sets it on the dock where it continues clean-up operations around the stockpiles and rescreening plant.

Aggregates are reclaimed from the stockpiles by a Barber-Greene conveyor working inside an Armco 84-inch recovery tunnel. Johnson hand-operated gates control the flow of materials from the stockpiles to the 30-inch belt, which extends 500 feet into the tunnel. This conveyor deliv-

**CONTRACTORS AND ENGINEERS**



**ATECO EARTHMOVING EQUIPMENT**  
Designed and Manufactured since 1920

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*Mack Woodruff*

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**BULLDOZERS • ROADBUILDERS • SCRAPERS • TAMPERS • RIPPERS • FARM IMPLEMENTS • FRONT LOADERS • HYDRAULIC PUMP • TANK & VALVE ASSEMBLIES**

For more facts, use Reader-Reply Card opposite page 18 and circle No. 227





An Oliver OC-3 tractor works inside a barge to push aggregates to the Owen clamshell with a front-end shovel. The flag on the tractor gives the crane operator an idea of where the tractor is working, since the Oliver is often completely out of sight.



After aggregates have been recovered from stockpiles by a conveyor and put through a shaker screen, they are carried up a 400-foot incline to the six-bin plant by a Barber-Greene 30-inch conveyor. Cement is brought in through the pipeline over the cofferdam cells, left, by a Fuller-Kinyon air conveyor. Concrete turned out by three Koehring 2-yard mixers goes to buckets carried by flatcars using the railroad track beneath the plant.

ers the aggregates to a Cedarapids 12-foot double-deck shaker screen, where the coarse aggregate—excluding the 6-inch cobbles—is rescreened to remove the fines. Another Barber-Greene 30-inch conveyor then carries the material up a 400-foot incline to the distributor at the top of the concrete plant.

#### Barges also carry cement

Barges bring cement to the site from the Universal Atlas mill at Hannibal, Mo., 60 miles downstream. The cement is carried from the barges to the 400-barrel cement bin in the center of the Johnson plant by a Fuller-Kinyon air conveyor system operating through a pipeline. Since barges serve as cement-storage facilities, an attempt is always made to keep a full barge at the dock, along with the one being unloaded.

Water for the mix, and for curing freshly-placed concrete in the lock, is pumped directly from the river by two Johnston 500-gpm turbine pumps. These pump into a series of 6-inch steel mains leading to the plant and to all parts of the job.

As concrete is batched, Protex air-entraining agent is added to the mixing water. The ingredients are charged into three 2-yard Koehring mixers on the lower platform of the plant which, in turn, discharge into the Johnson 4-yard buckets carried beneath the plant by flatcar. As soon as a full load is made up, the locomotive pulling the flatcars heads out again for the gantry crane.

THE END

#### Air entraining agent

■ On-the-job photographs, plus a description of the various uses of Darex air entraining agent, are contained in a catalog from the Dewey & Almy Chemical Co. The literature tells how Darex may be used in paving and structural concrete, ready-mix concrete, concrete pipe and blocks, and other products. Also pictured are dispensers, flow indicators, and air meters.

To obtain this catalog write to Dewey & Almy Chemical Co., 62 Whittemore Ave., Cambridge 40, Mass., or use the Request Card at page 18. Circle No. 95.

# Resists Shock!



Are the bearing units in your equipment subjected to heavy shock loads? Then, switch now to Sinclair HEAVY DUTY BEARING GREASE for better lubrication, longer bearing life. This *extreme pressure* grease is specially compounded for severe service lubrication in construction, mining and quarrying equipment.

Tests prove Sinclair HEAVY DUTY BEARING GREASE *resists shock loads, water, heat, throw-off, and squeeze out*. Try it—for longer, bearing life... higher productivity... lower operating costs.

A Sinclair Lubrication Engineer can give you expert counsel on how to get the most out of your equipment with Sinclair HEAVY DUTY BEARING GREASE. Phone your local Sinclair Representative or write Sinclair Refining Company, 600 Fifth Avenue, New York 20, N. Y. *There's no obligation.*

## SINCLAIR

## HEAVY DUTY BEARING GREASE

For more facts, use Reader-Reply Card opposite page 18 and circle No. 228

## Names in the news



E. V. Hunt, new assistant construction manager in charge of pipelines for Ebasco Services, Inc.

### E. V. Hunt to direct Ebasco pipeline work

Eldon V. Hunt, chief engineer of the Alberta Gas Trunk Line Co., Calgary, Alberta, Canada, has joined the staff of Ebasco Services, Inc., New York, N. Y., as assistant construction manager in charge of pipeline and related activities throughout the country. He had formerly been associated with Ebasco as a construction superintendent, managing such projects as a pipeline for the South Carolina Natural Gas Co.

In the gas and pipeline-engineering field for over 20 years, Hunt has worked on the construction of the Michigan-Wisconsin and Austin Field pipelines, the Transcontinental Gas Pipe Line in Texas, and later on Transcontinental operations in Alabama and Georgia.

During World War II, Hunt served as a colonel in the U. S. Army Corps of Engineers in Europe, the Philippines, and Japan. He worked on the construction and repairs to airfields and weather stations in Greenland upon his separation from the army.

In 1955, Hunt served as a consultant on the construction of a 24-inch gas line from Sui gas field to Multan in Pakistan.

### McClean elected director of F. H. McGraw & Co.

Frank J. McClean was elected a new member of the board of directors of F. H. McGraw & Co., New York, N. Y., engineering and construction firm, at the annual meeting of the board. Formerly secretary-treasurer of the firm, Mr. McClean was also made vice president in charge of finance.

Four other members of the board—Clifford S. Strike, Frederick J. Mayo, Donald W. Neville, and Joseph Lotterman were re-elected.

The board also elected R. B. Burroughs, company secretary; David Whittlesey, treasurer; and Harry W. Harvey, controller.

### N. J. highway engineer retires from service

Edward W. Kilpatrick, chief engineer of the New Jersey State Highway Department since 1950, has retired from state service. With the department since 1942, Kilpatrick has served also as a liaison agent and as assistant state highway engineer.

Otto H. Fritzsche will fill the position of chief engineer.

### Asphalt Institute names headquarters engineer

The former Atlanta, Ga., district engineer for the Asphalt Institute, Dillard D. Woodson, has joined the organization's engineering staff at its College Park, Md., headquarters.

Mr. Woodson served with the U. S. Army Corps of Engineers as an instructor in airfield and highway construction during World War II. He is a member of the Highway Research Board and the American Society for Testing Materials.

Arvel B. Klessig has been appointed to the post of district engineer cover-

ing Minnesota, Iowa, and North and South Dakota. He will serve directly under W. L. Hindermann, division engineer at St. Paul, Minn.

### NCA elects officers

The National Constructors Association, an organization composed of leading firms engaged in the engineering and construction of chemical, steel, and power plants, has elected C. D. Haxby president for the coming club year.

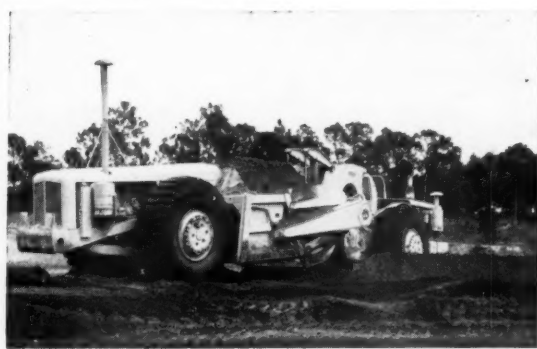
The new vice president is C. B. Whyte, president of Procon, Inc., Des Plaines, Ill.,

### Anderson-Nichols appoints chief structural engineer

Anderson-Nichols & Co., Boston, Mass., has appointed Octave W. Imer to the post of chief structural engineer. A graduate of the Swiss Federal Institute of Technology in Zurich, Imer specializes in design for bridges, highways, and industrial plants.

### Col. Dorland to join Nashville Bridge Co.

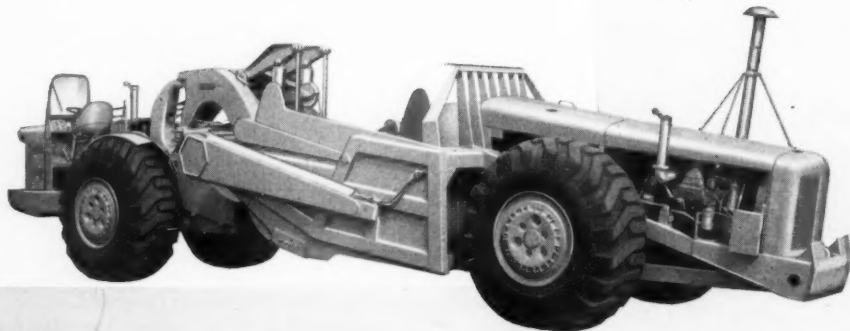
On July 1, immediately following his retirement from the U. S. Army, Col. Gilbert M. Dorland, District En-



On this Florida Turnpike contract of Blythe Bros., two TS-18 "Eucls" loaded, hauled and dumped in sandy conditions that "hung up" other equipment. The tremendous power and traction of this Euclid scraper made it a logical choice for this tough job.



Western Contracting Corp. used 12 of these TS-18 Euclid Scrapers on a 7 million yard Indiana Turnpike job. Because of the extremely difficult sandy conditions, the tractors were equipped with 300 h.p. engines. Top extensions added 6½ yds. to the bowl capacity.



Lever action and hydraulic control of bowl, apron and ejector make the TS-18 easy to operate. At the Glasgow Air Base in Montana, Harris Construction Co. used 4 of these Twin-Power Scrapers for grading and construction of runways.



## Small job or Big project

### EUCLID TWIN POWER in the TS-18 provides more work-ability than you get in any other scrapers

Twin-Power—the use of two engines on separate axles—was pioneered in the moving field by Euclid 10 years ago. Torque converters and semi-automatic transmissions insure easy operation and a smooth flow of power matched to all job conditions. One of Euclid's newest scraper models, the TS-18 uses power and drive components that have proved dependable performance in other "Euclid" hundreds of jobs.

The TS-18 is powered by two 218 h.p. engines—one in the tractor and another behind the scraper bowl. For work where even more power can be used, a 300 h.p. engine for the tractor is available. Both engines drive through separate Torqmatic Drives. Standard tires are 27.00 x 33 with 33.50 x 33 available as optional equipment.

**EUCLID DIVISION**  
**GENERAL MOTORS CORPORATION**  
Cleveland 17, Ohio



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ipment.

draulic lever action does away with cable headaches  
expense. All scraper operations—bowl, apron and  
actor—are independently controlled. All four of the  
draulic jacks are interchangeable...one spare fits

gineer for the U. S. Army Corps of Engineers at Nashville, will become assistant to Harry B. Dyer, president of Nashville Bridge Co., Nashville, Tenn.

The firm, which has a branch plant at Bessemer, Ala., is engaged in the fabrication and erection of steel bridges, and recently completed steel work on the new Memorial Bridge over the Cumberland River.

Col. Dorland, a graduate of the U. S. Military Academy at West Point, N. Y., received his master's degree in civil engineering from the University of California. His last four years of his 20-year service in the army have

been spent as head of the Nashville District.

He is a member of the American Society of Civil Engineers, the National Society of Professional Engineers, and the Society of American Military Engineers.

### Surveying, mapping group re-elects L. C. Higbee

At its annual meeting recently, the American Congress on Surveying and Mapping re-elected Lester C. Higbee to a second term as president of the organization. He is also the president of W. & L. E. Curley, engineering and



Lester C. Higbee, re-elected president of the American Congress on Surveying and Mapping.

scientific-instrument manufacturer of Troy, N. Y.

A civil engineer, Higbee is a graduate of Rensselaer Polytechnic Institute. He is a member of the New York State Society of Professional Engineers, the American Society of Photo-

grammetry, and the American Meteorological Society.

### Corps of Engineers news

Four assignments as district engineer have been made by the U. S. Army Corps of Engineers. Col. Henry C. Rowland, Jr., now attending the Army War College, Carlisle Barracks, Pa., will become district engineer at Wilmington, N. C., succeeding Col. Raymond L. Hill.

The Sacramento, Calif., district will be headed by Col. Albert E. McCollam, now assistant division engineer in the South Pacific Division. He succeeds Lt. Col. Alvin D. Wilder.

Col. John G. Schermerhorn will succeed Col. Lavonne E. Cox as district engineer at Tullahoma, Tennessee, and Col. Lynn W. Pine will become garrison district engineer, Riverdale, N. Dak., succeeding Col. Henry L. Hille, Jr.

Brig. Gen. Gerald E. Galloway, former assistant commanding general of the Engineer Center, Fort Belvoir, Va., has been assigned to the post of Missouri River Division Engineer. Reporting to his new post next month, Gen. Galloway will make his headquarters in Omaha, Nebr.

Col. John D. Bristor will become district engineer at Tulsa, Okla., succeeding Col. William J. Himes. Taking over the Detroit, Mich., district is Col. Peter C. Hyzer.

Col. Eugene J. Stann will become district engineer at Nashville, Tenn., and Col. Pierre V. Kieffer, Jr., will take over the Anchorage, Alaska, district.

Col. George B. Sumner has been assigned to the post of district engineer in Washington, D. C. The district engineer at Okinawa for the past year, Col. Sumner succeeds Col. Ray Adams in the position.

### Delaware shifts personnel in highway department

The combined duties of chief engineer of the Delaware State Highway Department and the Delaware Interstate Highways Division, a toll-road agency, have been assigned to Richard A. Haber. Haber had formerly served as chief engineer of the department, but for the past 2½ years, he has been associated with Michael Baker, Jr., Inc., Rochester, Pa. He is a member of the American Society of Civil Engineers and the National Society of Professional Engineers.

William J. Miller, Jr., formerly traffic and planning engineer, has been made deputy chief engineer. Leslie L. Maxwell will return as division engineer for New Castle County, a position he held several years ago.

Two other division engineers, Wallace F. McFaul and George H. Tunison, have been assigned to Kent and Sussex counties, respectively. Lester W. Novinger, former plans and design engineer, will become construction engineer, while James B. Bice, Jr., will be engineer in charge of equipment and maintenance.

For more facts, circle No. 229

# TS-18 "Euc"

## cuts earth moving costs!



**VERSATILITY**  
for a wide range  
of work!

anywhere. The low, wide bowl design and reversible four-section cutting blade make the TS-18 easy to load...heaped loads up to 24 yds. are picked up fast.

Like all other Euclid Scrapers, the TS-18 is built to stay on the job with less down-time for servicing and repair. All major components are readily accessible...a feature that really pays off in more work-ability and lower maintenance cost. Your Euclid dealer has facts and figures showing why owners everywhere say that **Euclids are your best investment.**

# Euclid Equipment

FOR MOVING EARTH, ROCK, COAL AND ORE





A gantry crane at the Ben C. Gerwick precasting yard in Petaluma uses a 6-point hookup to transfer one of the long precast piles to a barge for the 300-mile trip to the job site at Eureka, in northern California.

## Standardized sections are the key to a fast, economical bridge job

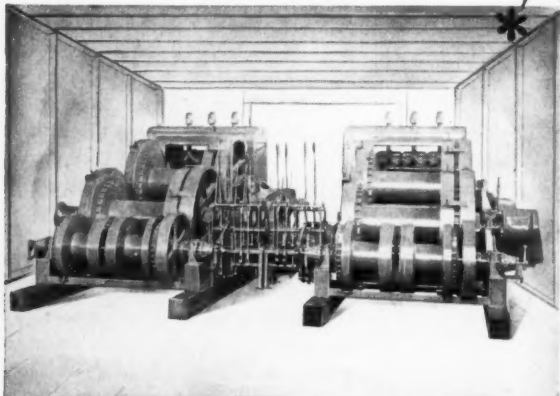
CLYDE "SAN FRANCISCO BAY BRIDGE" HOISTS TEAM  
WITH NEW CLYDE STEEL ERECTORS' HOISTS

# Spotting Steel on World's Largest Suspension Bridge

The twenty-four year old Clyde hoists operating the barge mounted derrick shown at right are proof of Clyde's sound engineering, quality construction and long-life dependability! Built in 1934 for The American Bridge Division, U. S. Steel Corp., for the San Francisco Bay Bridge job, these dependable units have been used almost continuously on a wide variety of applications . . . from one 'world's longest suspension bridge' to a new 'world's longest suspension bridge' now being constructed across the Mackinac Straits! Here's a record of an active, profitable life span of more than two decades under severe and exacting conditions!

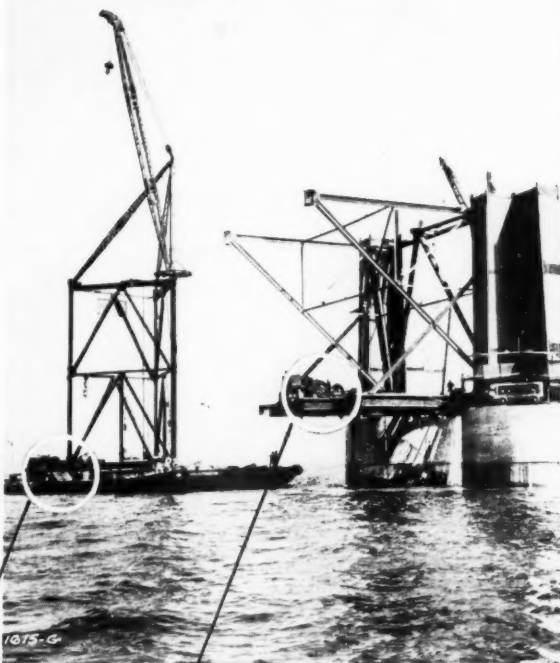
The engineering and structural advantages of Clyde's complete line of hoists are long-life, quality-plus Clyde features. Their capacity to do a job profitably recommends Clyde for the consideration of the most critical and cost-wise buyer.

Clyde's advanced engineering principles assure long, continuous, economical, safe and easy operation.



Clyde Twin Unit Hoists built in 1934 for American Bridge Company, used on San Francisco Bay Bridge . . . Now in use on Mackinac Straits Bridge.

Two Clyde Frame 8 Hoists will operate the Creeper Derrick shown below as it was being erected on the third tier of the main suspension tower of the Mackinac Straits bridge job



Here is equipment built to shave critical dollars from competitive bids now and a quarter of a century away!

If your material handling requirements call for dependable equipment, it will pay you well to get the facts from CLYDE!

Write for FREE Information! The services of our engineering department are at your disposal.



Four Drum Clyde Steel Erectors' Hoist with Bull Wheel Swinger

A high degree of standardization in the components of the 947-foot bridge across Eureka Slough, near the Oregon state line in California, is making this span one of the more economical bridges designed by the engineers of the California Division of Highways.

Scheduled for completion this July, the bridge is being built of units turned out in assembly-line fashion 300 miles from the job site. Everything but the pile caps for the span are being constructed by Ben C. Gerwick, Inc., San Francisco, in the firm's precasting yard at Petaluma, on San Francisco Bay.

Units turned out at the casting yard are brought 300 miles by sea to the job site, where they are assembled in building-block fashion by conventional construction machinery. A minimum of forming and concrete-mixing equipment is being used at Eureka, where Gerwick has assigned floating and land-based equipment to do the assembly work.

### Similar sections

The new 947-foot structure rests on precast, pretensioned concrete piles, which are capped by concrete mixed and placed in the field. The 28-foot-wide bridge deck is composed of precast, pretensioned units in standardized 30-foot lengths. Even the 105-foot navigation span in the center of the bridge consists of seven pretensioned girders, weighing 66 tons each, which were manufactured in San Francisco.

Pile lengths for 139 units vary from 45 to 105 feet, but all pile units are 20 inches square and contain a 12-inch-diameter Sonovoid and 18 Roebling  $\frac{3}{8}$ -inch 7-strand pretensioning cables. The total pretensioning load on each pile, after an assumed loss of 30,000 psi, leaves 200,000 pounds of force active on each unit.

### Deck slabs pretensioned

The 252 pretensioned deck-unit slabs are 30 feet long, 15 inches deep, and 4 feet wide. Each contains three 8-inch-diameter Sonovoids and 35 Roebling  $\frac{3}{8}$ -inch 7-strand pretensioning cables. The end area of individual wires in these cables is 0.0799 square inch. After the wire has been prestressed to 60 per cent of ultimate strength in the deck slabs, a total force of 242 tons is applied initially per slab. Discounting usual losses through thermal shrinkage and other ordinary factors, a total force



HOISTS—DERRICKS—WHIRLEYS—BUILDERS TOWERS—CAR PULLERS—HANDI-CRANES—ROLLERS  
**CLYDE IRON WORKS, INC.**  
Established in 1899  
**DULUTH 1, MINNESOTA**



For more facts, use Reader-Reply Card opposite page 18 and circle No. 230



**Precast piles, girders, and deck sections for the span are mass-produced and barged 300 miles to the job site**



Reinforcing is set for a row of the 30-foot-long pretensioned deck-slab sections. Two rows of these units are poured on the 500-foot-long bed at the yard. The row at right is being steam-cured under a hood.

of 200 tons of pretensioning is active in each unit.

The 105-foot girders for the navigation span are 4½ feet deep and have cantilevered and reinforced top webs that will create the deck area. The long girders are being posttensioned rather than pretensioned. Roebling 1½-inch cables, arranged elliptically so that live loading forces are counteracted, are used for tensioning. Each girder section has a final working tension load of 865,000 pounds after an assumed 22,000-psi loss. The long girders are also being posttensioned transversely for added safety after they have been erected in the field.

**Assembly-line methods**

A well-planned assembly-line technique is being used by the Gerwick company to turn out the bridge components at Petaluma. The line consists of a 500-foot-long concrete casting and prestressing bed, wide enough for two rows of deck units or three rows of concrete piles. The big girders are being made in another part of the yard, where traveling cranes are available to make the 66-ton lifts.

Re-usable steel and wood forms are being used to cast the deck sections. These are strung end to end on the casting bed so that 15 sections are in one line for prestressing and one continuous concrete pour. After the reinforcing steel and Sonovoids have been placed, the pretensioning cables are strung from reels of Roebling cable mounted on a rack at one end of the bed. The cables are strung in one piece through the entire line of deck units and secured at the jacking end through a heavy steel plate and Reliable cable anchors. A similar anchorage holds the cables at the rack end. Jacking stress is applied by hydraulic cylinders, actuated by fluid pumped by Wisconsin-driven Vickers pumps. A similar forming and prestressing arrangement was also used when the piles were cast.

The concrete for these units comes from a nearby commercial batching plant, owned and operated by Gerwick to serve the Petaluma area. Challenge truck mixers deliver the fresh material to an Osgood railroad-mounted crane that uses a Gar-Bro 1-yard bucket to fill the forms. Viber electric vibrators are used internally to distribute concrete around all the steel.

After a line has been poured, steam-curing chest sections made of

(Concluded on next page)



**There's a Torcon unit to meet your job requirements**

Here is a complete line of torque converters designed to meet a wide range of engine applications in all industrial fields.

The Clark Torcon unit is a three-element single stage converter of simple design, mass-produced. It is available off-the-shelf to owners and operators of equipment, as well as to manufacturers.

**HORSEPOWER RANGE**  
... 15 to 600

**DIAMETERS**  
... 11" to 26"

**COMPLETE CHOICE**  
of options for easy fit into practically any torque transmission system.

For full information refer to illustrated easy-to-read Torcon bulletin.

**CLARK®  
EQUIPMENT**



**This helpful bulletin describes TORCON advantages...**

**Send for it**

- **True Hydra-Foil Blade Design**  
—a patented feature. Correct combination of blade contour and angles assures smooth oil flow, for most efficient torque multiplication. No cavitation to cause turbulence or air pockets which impair efficiency and cause destructive wear.
  - **Self-Contained Oil Circuit**  
—Sump is cast integral, and oil passages are cored in the housing. No unnecessary hoses and fittings; no external oil seals under pressure.
  - **Easy Accessibility**  
—Inspection plates are easy to get at; no special tools needed.
  - **Individually Cast One-Piece Elements**  
—no welds or fabrications to distort under extreme loads.
- Every user of horsepower will find this bulletin well worth reading. The coupon brings your copy promptly—no obligation.

**CLARK EQUIPMENT COMPANY**  
Jackson 7, Michigan

☐ Please send copy of The Torcon Bulletin

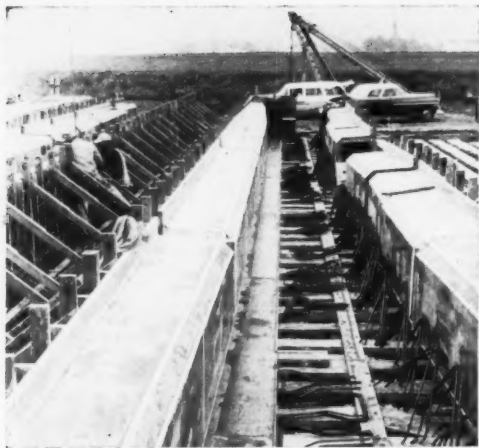
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For more facts, use coupon, or Reader-Reply Card opposite page 18 and circle No. 231



The 66-ton pretensioned girders needed for the 105-foot navigation span are cast with prefabricated plywood forms being assembled at the yard on San Francisco Bay. Reinforcing steel stirrups are ready to be set.



"I tell you I saw it myself—  
a machine that lays 1800 feet of  
finished curb a day . . . without forms!"



And that's not  
the whole story—

the **Stephens-Canfield  
AUTOMATIC  
CURBER**

is self-propelled and  
requires only three men to  
operate—needs no forms.

**Saves time and money!**

Cost of laying curbing by this entirely new method is only a fraction of that of conventional methods, which means tremendous savings to the users of the STEPHENS-CANFIELD AUTOMATIC CURBER.

Here's all you do—simply mark out location, start the motor and fill the hopper with asphaltic or Portland Cement concrete, that's all . . . the concrete is extruded through the worm gear into the curb mold under high pressure causing the machine to move forward. The operator merely guides the curber. Interchangeable molds plus adjustable wheels provide a choice of eighteen different shapes from 6" to 12" high and 7" to 10" base widths. Many state highway departments are now saving time and money with STEPHENS-CANFIELD AUTOMATIC CURBER.

Write for full details and prices.



For more facts, use Reader-Reply Card opposite page 18 and circle No. 232

(Continued from preceding page)

wood are set over the freshly poured slabs by the crane. A 24-hour cure under steam at 140 degrees develops a 3,500-psi strength in the units. They are then exposed to a 16-hour air cure before being placed in the storage yard to await shipment.

Precasting of the big girders for the navigation span is being handled in a different manner, chiefly because of the size of these units. Plywood form sections are prefabricated at the carpenter shop and set in position in much the same way as if the job were being done at the bridge site. This has several advantages: carpenters are able to work at ground level, where they are much more efficient; cranes are available for lifts; and the problem of transporting or hoisting carpenters' tools is eliminated.

The small amount of equipment being used at Eureka includes a floating pile driver with a Vulcan hammer, a conventional rig used to drive the piles. A large floating derrick will be used to raise the girders. A small carpenter-shop setup at the site turns out the cap forms, while a small truck crane with a transfer bucket is used to place the truck-mixed concrete.

Though many persons share in the responsibility for the design and construction of the bridge, a large share of the credit goes to California state highway engineer George T. McCoy and assistant state highway engineer for bridges, F. W. Panhorst. The job is now in its last stages, and the experiment is turning out well. So well, in fact, that the project officials believe assembly-line bridge building will be undertaken more and more as units become standardized.

THE END

#### Motor graders

■ The Huber-Warco Models 6-D and 7-D motor graders, featuring 102 and 140 horsepower, respectively, are described in a bulletin from the company. Both units have torque converter, power-shift transmission, hydraulic control system, cab-controlled movement of the blade, and standard power sliding moldboard, according to the manufacturer. Also mentioned in the bulletin is the company's complete line of three-wheel rollers, tandem rollers, motor graders, and Maintainer.

To obtain Bulletin No. HWG-521 write to Huber-Warco Co., 202 N. Greenwood St., Marion, Ohio, or use the Request Card at page 18. Circle No. 90.

#### Sonneborn opens Canadian plant and sales office

The building products division of L. Sonneborn Sons, Inc., New York, N. Y., has opened a new plant and sales office in Toronto, Canada. The new subsidiary will do business as Sonneborn, Ltd.

The 40,000 square-foot plant housing the Canadian operations, will produce a complete line of building-maintenance products. The plant will be staffed by Canadian personnel.

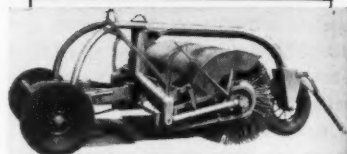
#### Compression tester

■ The Forney Model LT-500 compression and flexure testing machine is detailed in a folder from the manufacturer. According to the folder, the 375,000-pound-capacity machine tests cylinders, cubes, concrete blocks, beams and lintels, the compression and modulus of rupture of brick, and other concrete and cement products. The folder states that the Model LT-500 meets ASTM specifications. A full description of operating parts is included.

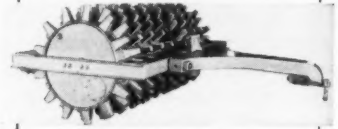
To obtain this folder write to Forney's, Inc., P. O. Box 310, 209 Elm St., New Castle, Pa., or use the Request Card at page 18. Circle No. 93.

Buy a U. S. Bond today.

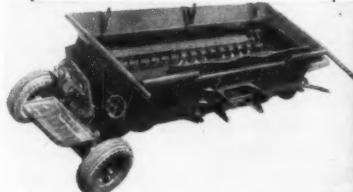
#### Grace ASPHALT AND COMPACTION EQUIPMENT



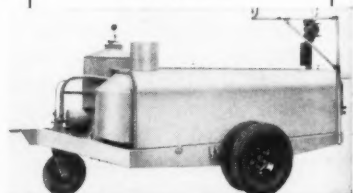
Roadsweepers, traction, engine-driven or tractor-mounted



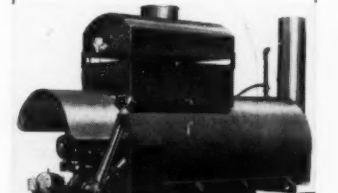
Sheepfoot rollers



Chip spreaders



Circulating asphalt heaters



Automatic oil heaters for hot plants



Pneumatic rollers, self-propelled or trailed

**W. E. GRACE MFG. CO.**

6003 S. Lamar • Dallas, Texas

For more facts, circle No. 233

CONTRACTORS AND ENGINEERS

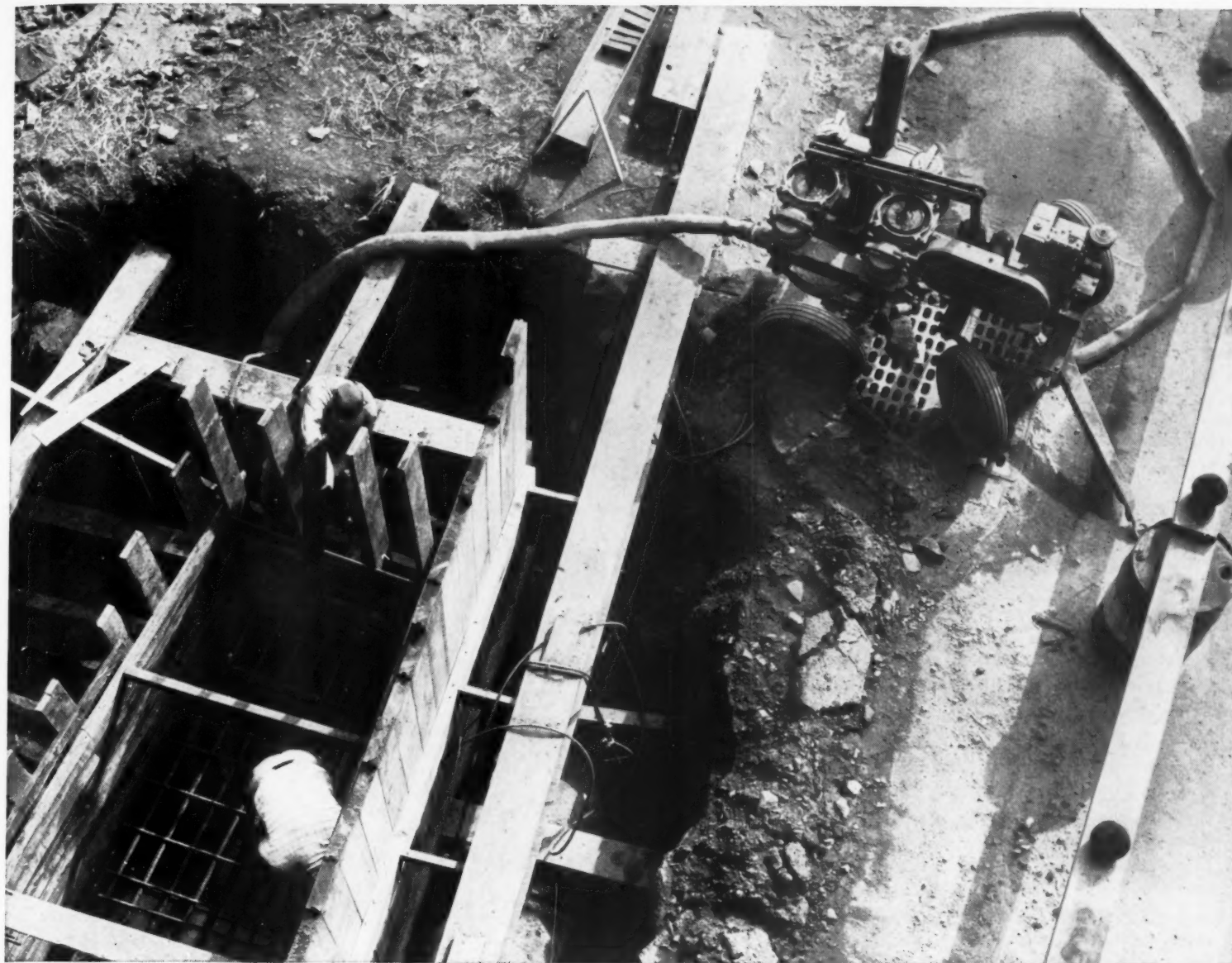


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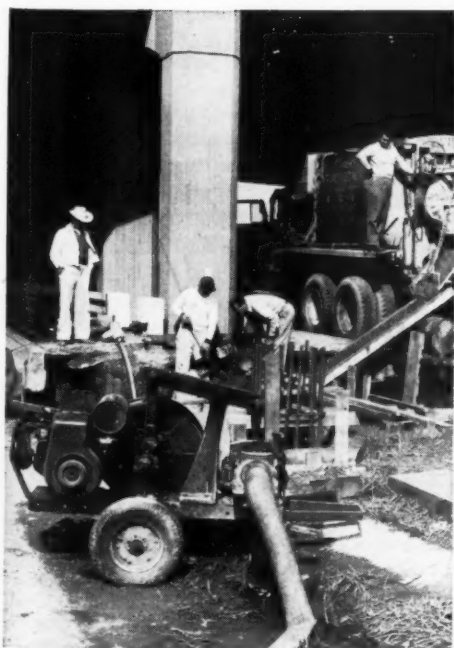
ne-



An engine-driven, double diaphragm Marlow Mud-Hog keeps excavation dry to speed erection of forms. Note spring-mounted chassis with automotive-type wheels for high-speed towing.

## "Jersey Meadow" Job Poses Pumping Problem

### Marlow Mud-Hogs Hold Heavy Seepage on Footing Excavations



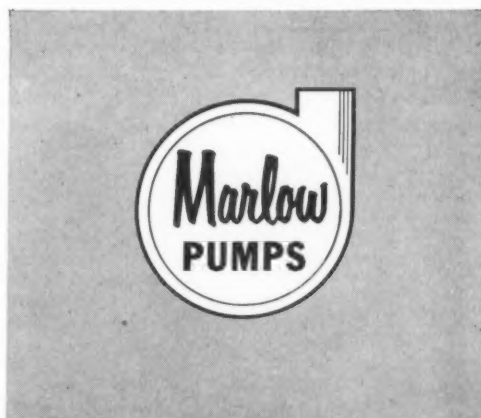
A single diaphragm Marlow Mud-Hog pumps water from excavation as pour is started. Pump constantly re-primed as water level drops below suction line then rises again.

The Union Building and Construction Corp., Passaic, N. J., is widening five miles of the New Jersey Turnpike between Secaucus and Ridgefield Park. This stretch runs through the "Jersey Meadows," a vast tidal swamp. In adding 14-foot lanes to each side, Union must also widen two overpasses and three stream bridges to handle the traffic now using the turnpike.

Excavations for the pile footings that support these overpass piers have to be made in ground where the surface is only inches above the tidal level. To handle the constant water-table seepage, Union uses Marlow Mud-Hogs because of their ability to handle muddy, debris-laden water without clogging. John De Leeuw, Project Manager, said, "Not once has the job been held up because of pump failure, despite a 24-hour pumping schedule since April 1955!"

Marlow Mud-Hogs are built to take the rough and rugged use on tough pumping jobs. They prime automatically and can pass surprising quantities of mud, sand, stones, and trash without damage. If you have a job that calls for tough pumping, it will pay to use Marlow Mud-

Hogs. For complete information on rugged, dependable mud-hogs, A.G.C. rated self-priming centrifugal pumps and the name of your Marlow dealer, write Marlow Pumps, Midland Park, New Jersey. No obligation.



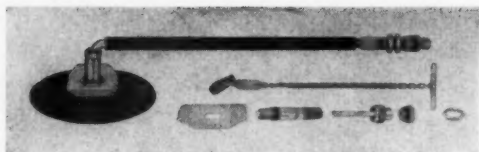
**MARLOW PUMPS**

Division of Bell & Gossett Company  
MIDLAND PARK, NEW JERSEY

Morton Grove, Illinois

Longview, Texas

For more facts, use Reader-Reply Card opposite page 18 and circle No. 234



The Schrader swivel-type large-bore tire valve.

### Swivel-type valves allow left or right mounting

■ Swivel-type large-bore tire valves designed for off-the-road equipment are available from the A. Schrader's Son Division of Scovill Mfg. Co., Inc., along with a complete line of accessories. Extension stem lengths of 2½ inches and up, in ¼-inch increments, are also available.

The swivel feature of the valve permits left or right-hand mounting, thereby allowing a smaller tube in-

ventory. A nylon ball check in the base of the valve prevents retraction of the spud after the tire and tube have been partially inflated. The valve spuds fits all off-the-road equipment in the standard ⅝-inch rim slots.

In addition to hand-bendable extension tubing, other accessories include deflators, valve finishing and inflating tools, curing extensions, tire gages, air chucks, valve caps and

cores, and valve and core repair tools and wrenches.

For further information write to A. Schrader's Son Division, Scovill Mfg. Co., Inc., 470 Vanderbilt Ave., Brooklyn 38, N. Y., or use the Request Card at page 18. Circle No. 114.

### Hyster promotes engineer to eastern division post

Hugh Richmond of the home-office engineering department has been promoted to the sales engineering department of the eastern industrial truck division of the Hyster Co., Portland, Oreg. He will make his headquarters in Danville, Ill.

Mr. Richmond has been associated with Hyster for 4½ years.

### Ladder-type hoist unit easy to move, set up

■ Speed and performance are reportedly combined in the new ladder-type hoist device offered by the Bloomfield Tool & Gauge Co. The unit weighs approximately 110 pounds in the 16-foot length and can be carried on a pickup truck or a simple car-top carrier. It is ready to operate in a matter of minutes.

By means of a special cradle the Briggs & Stratton 2-hp motor is hung on a safe-weight heat-treated aluminum ladder manufactured by the Louisville Ladder Co. The chain drive is connected to the motor with a V-belt which acts as the clutch through the application of foot pressure to the bottom bar of the motor cradle.

The hoist, designed to lift and stack bundles of roofing or building materials, can be fitted with an adapter to hoist concrete blocks, bricks, or mortar buckets. When all materials have been lifted to the working area, the ladder is available for the workmen to climb.

For further information write to the Bloomfield Tool & Gauge Co., 2172 S. Telegraph Road, Pontiac, Mich., or use the Request Card at page 18. Circle No. 110.

### Winter-summer cabs have detachable parts

■ All-weather cabs designed to fit a number of tractors or other construction machines are offered by the Industrial Cab Co. Their design is said to make these units the most versatile cabs available to the construction industry.

Because these cabs have a number

## Compare... WITH ANY OTHER CONCRETE BREAKING TOOL

Put the Superkut Chisel in operation, side-by-side with any other tool, preferably the one you're using now. Then compare them...

... **for Speed** The Superkut Chisel provides a unique wedging action that splits off big chunks fast. It outperforms moil points by 10 to 1, is three times faster than conventional wedge or spread points.

... **for Economy** In the long run, the Superkut Chisel is more economical. Forged from high grade electric furnace steel, and hardened to Vulcan's rigid specifications, this tool wears longer, tends to resharpen itself. Many Superkut Chisels have worn to half their original length without need for resharpening.

... **for Versatility** The Superkut Chisel has proved in the field that it can cut through heavy mesh or reinforcing rods without fouling or jamming; that it works as well on asphalt, brick or cobblestone as on concrete or rock. Truly, no more versatile tool is available anywhere.

Vulcan tools are sold by distributors throughout the United States and Canada

Specify VULCAN for:

PAVEMENT BREAKING TOOLS  
CLAY DIGGING TOOLS  
DRILL STEELS  
PNEUMATIC HAMMER TOOLS  
ELECTRIC HAMMER TOOLS  
HAND TOOLS FOR CONCRETE, STONE, & STEELWORKERS



## VULCAN TOOL MANUFACTURING COMPANY

41 LIBERTY STREET, QUINCY 69, MASSACHUSETTS

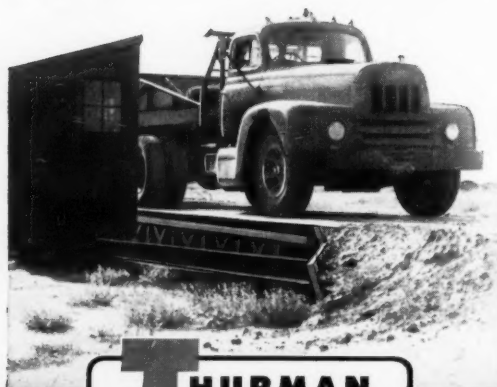
Specialists in the Design and Production of Pneumatic Tool Accessories

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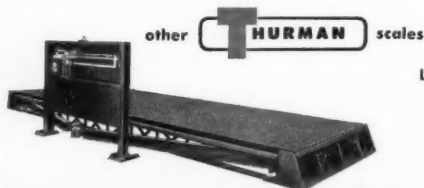
## ACCURATE PORTABLE WEIGHING

### THURMAN PROVED EASIEST Truck Scale to move!



**NO CONCRETE PITS NEEDED!** Thurman Portable Truck Scales maintain their accuracy under the most rugged conditions. These scales move from job to job easily... set-up in minutes. Ramp earth at each end, lets truck move into position. Proven by on-the-job performance and accuracy with hundreds of contracting firms. Write today for bulletin 601. Capacities: 20 to 50 ton. Deck Lengths: 18 to 43 ft.

can also be installed as a PITLESS SCALE—saves on expensive pit costs



Batching Scales  
Liquid Weighing Scales  
Portable Truck Scales  
Industrial Scales  
Pit Scales  
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THURMAN

Precision Products since 1918

THURMAN MACHINE COMPANY, DEPT. O 156 N. 5th STREET, COLUMBUS, OHIO

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of detachable parts, they are reported to provide the ideal combination for any weather condition in winter or summer. Doors swing back or are easily detached. Lower sections are removable to provide good cross ventilation. A tinted safety glass skylight is available in certain models.

Four end-gate catches secure the cab to the machine, and the unit can be detached and removed in 10 seconds.

In addition to fully enclosed and semi-enclosed cabs for Michigan and Hough loaders, and other makes of equipment, the company is now working on an all-cast-aluminum cab, consisting of three pieces, which is said to provide even greater versatility.

For further information write to the Industrial Cab Co., 36 Jefferson Ave., Salem, Mass., or use the Request Card at page 18. Circle No. 149.

CONTRACTORS AND ENGINEERS





USING JEEPS TO TRANSPORT survey crews, Leo L. Strecker, president of the Karl F. Tuttle Engineering Co., Inc., Arcadia, Calif., is speeding up preparations for the third year of work on a government contract in Alaska. Regardless of the below-freezing temperatures prevailing throughout the better part of the year, the firm expects to employ 85 men on survey work on the \$400,000 1956 surveying contract. The work is being done for the Alaska District, Corps of Engineers.

### Road maintenance

■ Spring maintenance of unpaved roads with calcium chloride is detailed in a leaflet from the Calcium Chloride Institute. Preliminary topics cover the importance of early spring maintenance and maintenance procedures. Technical information is given on shaping, crowning, and application of calcium chloride to roads that have and those that have not been treated previously with the chemical. A chart lists the amount of calcium chloride recommended for various road widths.

To obtain the leaflet write to the Calcium Chloride Institute, 909 Ring Bldg., Washington 6, D. C., or use the Request Card at page 18. Circle No. 151.

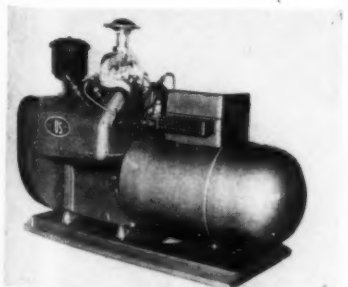
### Add new 10-kw plant to generator line

■ Especially suited for large jobs where contractors use a number of electric tools and lights simultaneously is the new 10-kw electric plant recently added to the U. S. Motors Corp. line.

Using a Wisconsin VF4 4-cylinder, 4-cycle, V-block, 1,800-rpm engine, the rig weighs only 730 pounds. It is 43 inches long and 29 inches high, and is available with standard voltage, single, and 3-phase generators.

Standard equipment for the electric plant includes muffler, air cleaner, fuel pumps, magneto ignition with radio shielding and a two-rate battery-charging circuit on electric start models.

For further information write to U. S. Motors Corp., 131 Nebraska St., Oshkosh, Wis., or use the Request Card at page 18. Circle No. 2.



U. S. Motors' new electric plant is rated at 10,000 watts continuous output.

MAY, 1956

ANY shoe does not fit EVERY foot...

ANY truck does not fit EVERY

job . . .



NOW, there's a Custom-Built Crane Carrier chassis for off-highway hauling engineered to meet your requirements at a popular price!



Fit the Truck to the Job with a CCC "Custom-Built" Carrier!

• Manten Wide-Flange "H" Beam Frame

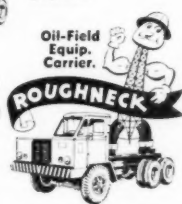


• International Harvester Engines



• Eaton, Timken & Clark Tandem Axles

• Fuller Transmissions



PLUS 74 Crane Carrier models especially designed for the construction industry!

Crane  
Carrier  
Corp.

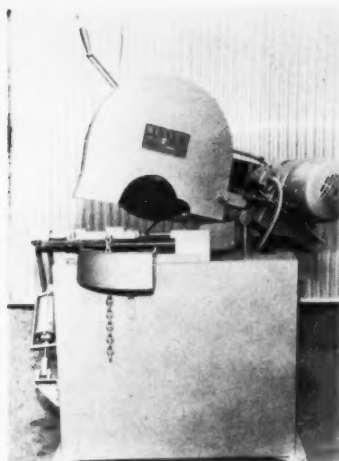
Standard of the Industry

SEE YOUR DEALER, or WRITE . . . **TODAY!**  
CRANE CARRIER CORP., P. O. BOX 5008,  
TULSA, OKLAHOMA.

Please send complete information on  
CCC "Custom-Built" Carriers

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COMPANY \_\_\_\_\_  
ADDRESS \_\_\_\_\_  
CITY \_\_\_\_\_ STATE \_\_\_\_\_

For more facts, use coupon, or Reader-Reply Card opposite page 18 and circle No. 237



The No. 20 any-angle abrasive Speed-Cut machine will make cuts at angles between 30 and 90 degrees.

### Add two new cutters to pipe tool line

■ Two new abrasive cutting machines have been added to the line of equipment manufactured by Beaver Pipe Tools, Inc. They are the No. 20 any-angle abrasive Speed-Cut and the No. 20 wet-cutting abrasive Speed-Cut.

The cutting head of the any-angle unit swivels in a 60-degree arc, permitting cuts at angles between 30 and 90 degrees. It will make 90-degree cuts on pipe up to 6 inches in diameter; maximum pipe diameter decreases progressively as the cut angle decreases. It will cut solids up to 2½ inches in thickness.

The wet-cutting model will handle 4-inch pipe or shape and 2½-inch solids. It is equipped with a circulating cooling pump with separate motor and control. A settling tank with two baffles filters out sediment from the coolant, which consists of water and a rust inhibitor.

For further information write to the Beaver Pipe Tools, Inc., 325 Dana St. N. E., Warren, Ohio, or use the Request Card at page 18. Circle No. 124.

### New cement admixture produces higher strength

■ Development of a new admixture for cementitious mixes which is said to provide up to 40 per cent higher ultimate strength in less time and with a possible 15 per cent savings in cement has been announced by the Building Products Division of L. Sonneborn Sons, Inc. Called Sonotard, the new material is designed to slow up the setting of concrete and mortar mixes, thus allowing more effective control of mixing, placing, and finishing.

Sonneborn chemists claim it produces higher compressive strength, reduced permeability, more homogeneous concrete, minimum shrinkage, and superior, denser finishes at reduced cost.

Under test conditions, the admixture was reported to have produced 28-day specified strength as early as the seventh day.

For further information write to the Building Products Division, L. Sonneborn Sons, Inc., 404 Fourth Ave., New York 16, N. Y., or use the Request Card that is bound in at page 18. Circle No. 80.

### New charts show logs, multiply and divide

■ Two new mathematical charts, distributed by the Frederick Post Co., provide a handy reference that can be used for the same purpose as a slide rule or calculating machine.

The Calciline charts, furnished on heavy 8½ × 11-inch card stock, consist of a log scale superimposed diagonally upon a log grid. The Multiphase chart includes scales for multiplication and division, as well as those for obtaining directly the square root, cube root, and logarithm of a number. The multiplication and division

chart has the same pattern, but without the log, square, and cube root curves. Both contain examples illustrating the operations which can be performed.

The distributor recommends the three-hole-punched charts for field calculations, because they can be inserted in the back of notebooks for ready reference. For administrative personnel, the charts can be placed under a glass desk top.

For further information write to the Frederick Post Co., 3666 N. Avondale Ave., Chicago 18, Ill., or use the Request Card at page 18. Circle No. 127.

### Portable hoisting unit operated by one man

■ A manually-operated portable hoisting and pulling unit that can be worked by one man, weighs only 42 pounds, has a nominal capacity of 3,300 pounds using ½-inch wire rope, and can handle rope of any length because it doesn't utilize a take-up spool, is marketed by Princeton Grip-hoist, Inc.

The Tirfor Grip-hoist is built on the draw vise principle. Movement of the load is accomplished by two pairs of jaws that alternately grip and draw a rope through the machine. Load

# AMAZING!...NEW!...

## Rear-engine 1¾ yard

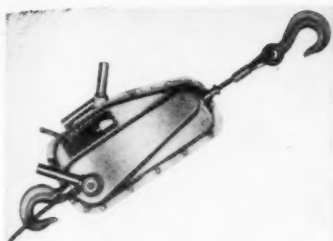
**40° BUCKET TIP-BACK AT GROUND LEVEL** permits digging of bigger bucket loads, plus retaining of more of load in bucket during lifting and carrying.

**PRY-OUT BUCKET ACTION:** Tremendous 17,500-lb pry-out force is obtained by using break-out pads on ground as fulcrum for leverage. This transfers load forces to ground instead of to machine.

**40°**

**OPERATOR SITS COMFORTABLY** in foam-rubber seat, handles conveniently-placed, power-assisted controls, can see load and cutting edge at all times.





The Tirfor Griphoist.

movement is controllable to 1/1,000 of an inch, according to the manufacturer.

The nominal power can be multi-

plied by means of tackle blocks. Basically, the machine will hoist or lower at a rate of 10 feet per minute, with a 77-pound lever effort by one operator.

Five of these machines were used recently on a West Coast bridge-widening job to move a 75-ton steel and timber falsework structure 26½ feet across the top of five pile bents. The operation was accomplished in 4 hours of pulling time.

For further information write to Princeton Griphoist, Inc., 32 George St., Boston 19, Mass., or use the Request Card that is bound in at page 18. Circle No. 112.

## Steel-reinforced slabs

■ Flexicore slabs, steel-reinforced hollow-cast units for floors and ceilings, are illustrated and described in a catalog from the firm. Detail drawings of elementary and secondary schools show the slabs used for heating, roofing, and flooring. The catalog states that slabs are resistant to fire, decay, and rust. Job photos and pictures of the finished schools are included.

To obtain this catalog write to Flexicore Co., Inc., 1932 E. Monument Ave., Dayton 1, Ohio, or use the Request Card at page 18. Circle No. 55.



The West Skytrak places building materials to a height of 20 feet 6 inches.

## Tractor attachment lifts to over 20 feet

■ The Skytrak, a tractor attachment for placing brick, masonry, and other materials to a height of 20 feet 6 inches on building projects, is marketed by the West Brick Buggy Corp.

The hydraulically operated lift attachment is mounted on a Minneapolis-Moline ZB tractor having 37.48 horsepower. The attachment has a lifting capacity of 3,000 pounds, and will reach to the 20-foot 6-inch maximum height in 17 seconds. The unit is recommended for lifting, unloading, or stockpiling such material as brick, concrete block, lumber, forms, light structural steel, and other building materials. It can also be adapted for use in pouring concrete.

The Skytrak is said to perform the work of 20 laborers using wheelbarrows and hand methods to move building materials.

This front-end lift attachment is one unit in the West masonry-handling system, which also includes brick and mortar buggies and a Hi-Lift brick buggy.

For further information write to the West Brick Buggy Corp., 4310 Mayfield Road, Cleveland 21, Ohio, or use the Request Card that is bound in at page 18 of this issue. Circle No. 150.

## Film treats problems of concrete quality control

A colored motion picture showing how better uniform-quality concrete is being produced through improved control of water, air, and rate of hardening has been produced by Master Builders Co., Cleveland, Ohio.

Entitled "The Man With the Trowel", the film treats the problems of meeting concrete requirements caused by variables in materials and conditions, and shows how Pozzolite is being used as an aid in obtaining better uniform-quality concrete.

The 30-minute film is available for private showings to groups and may be obtained from the Master Builders Co., Division of American Marietta Co., Cleveland 3, Ohio.

←For more facts, circle No. 238

# International Payloader

New—this highly-maneuverable crawler tractor-loader with "power-shift" transmission teamed with Torque-Converter advantages—to give you maximum possible material-moving capacity and speed in any given condition.

Operator sits up front, close to bucket, can always see what he's loading, where he's going.

Speed unmatched in crawler history, 10 mph forward, 13 mph reverse, provides faster cycles.

If it's *speed* and *maneuverability* and *big capacity* you want in a crawler-loader, see the new International 1¾ yard Model 12 Payloader!

This amazing new 91½ hp loader seats its operator in front of the engine, up close to the bucket, where he has an unobstructed view of everything from cutting edge to toe of bank. It balances the tractor between rear-mounted engine and front-mounted bucket. Weight is evenly distributed over entire length of tracks. You get better traction, longer track life, better stability on grades, less bogging down in spongy ground.

Your operator moves faster on this new Payloader, too. He can go up to 10 mph forward, 13 mph in reverse. He changes speeds or direction instantly through a full-power shift, three-speed transmission. No waiting, no stopping, ever! All shifts through all speeds can be made in either forward or reverse under full engine speed WITHOUT SLOWING DOWN. Torque-converter gives you maximum digging-power for the toughest jobs. (Operation gets another boost from the torque converter . . . it provides an infinite range of speeds, automatically selecting the one which best balances load and torque.) Steering is a finger-tip cinch, too, because each *steering clutch* and *brake* is controlled by one power-boosted lever only (no foot steering brakes).

Try this new International Model 12 Payloader for yourself. Your International Industrial Power Distributor will be glad to demonstrate. Call him soon! A good deal awaits you!

## International Industrial Power

180 N. MICHIGAN AVENUE—CHICAGO 90, ILLINOIS

A COMPLETE POWER PACKAGE INCLUDING: Crawler, Wheel, and Pipe-Boom Tractors . . . Self-Propelled Scrapers and Bottom-Dumps . . . Tractor and Rubber-Tired Loaders . . . Diesel and Carbureted Engines





In a borrow pit, a Bucyrus-Erie 54-B shovel loads select material for the top foot of the grade into a Euclid bottom-dump for hauling to the roadway.

C&E Staff Photos



## New Oklahoma Northeastern Turnpike

**One contractor handles 1,300,000 yards in 7½-mile section; scrapers and shovels move rock in tough section of the stretch**

No sooner had the first contracts for the 88½-mile Oklahoma Northeastern Turnpike been awarded last April, than earthmoving equipment began moving onto the right-of-way. And immediately after the last of the grading and bridge contracts had been awarded in November, the Oklahoma Turnpike Authority began advertising for bids for the paving.

Contractors started paving operations in February of this year, and construction of the entire \$68 million

project is scheduled for completion by July, 1957.

Beginning at the junction of U. S. 66 and Oklahoma 33, about 12 miles east of Tulsa, the turnpike follows a northeasterly course as far as the Missouri state line, where the Missouri Highway Department is building a road to connect the turnpike with U. S. 66 near Joplin, Mo. The pike will have barrier-type toll gates at the Missouri line and at the Tulsa terminal. Five other interchanges

connecting with principal highways will be located near Claremore, Big Cabin, Vinita, Afton, and Miami.

Financed by a \$68 million bond issue, the turnpike is being built without state or federal aid or credit. The principal and interest of the bonds are to be repaid from tolls and other revenues of the project. Administration of the Oklahoma toll roads, including the existing Turner Turnpike, the Northeastern Turnpike now under construction, and two other proposed

As the grade is built up, each lift is bladed and compacted. This Adams Model 610 motor grader shapes the surface, while an Allis-Chalmers HD-20 tractor and a Gebhard three-drum sheepfoot roller complete compaction.

Material is loaded at the borrow pit by a Euclid loader, which dumps to a fleet of bottom-dump Euclids hauling material to a fill area. A total of 13 bottom-dumps are hauling from this pit.







Starting a new cut, a Euclid scraper pushed by an International TD-24 strips the sod and topsoil, which are stockpiled for future finishing. As soon as the fill area is stripped, the entire surface will be scarified.



An International TD-18A tractor pulls an Amco disk scarifying an area on which a fill will be built. Only one section of the disk is used for this operation. Sod and topsoil will be stockpiled for use on slopes.

roads reaching to the Kansas and Texas borders, is handled by the Oklahoma Turnpike Authority, an agency of the state.

General planning and coordination of other engineering activities are being handled by DeLeuw, Cather & Co., Chicago, Ill., consultants to the authority. The consulting engineering firms preparing plans for specific grading and paving sections and for bridges will also supervise construction of the projects. Separate contracts will be awarded for structures, grading, and paving, with bridge contracts usually including some adjacent grading.

#### Has 15-foot raised median

The Northeastern Turnpike consists of two 24-foot paved roadways separated by a raised grassed median 15 feet wide. Paved shoulders on the outside of both roadways are 12 feet wide and slope at 3 to 1 to an 8-foot rounded ditch 5 feet below the roadway. Backslopes of 2 to 1 are benched on cuts over 20 feet in depth.

The pavements are not crowned but have a cross slope of  $\frac{1}{8}$  inch per foot toward the outside. Designed for 16 feet vertical clearance, the bridges also have 10 feet horizontal clearance from the edges of the roadway. The

right-of-way, averaging 300 feet wide, will be fenced on both sides as there are no grade crossings with railroads or other highways. Long acceleration and deceleration lanes are provided for vehicles entering or leaving the highway at interchanges or service areas.

One of the first grading contractors on the job was J. W. Moorman & Son, Muskogee, Okla., the successful bidder on sections both north and south of Vinita. Working several sections simultaneously, Moorman used a number of spreads of equipment. On a  $7\frac{1}{2}$ -mile section near Big Cabin, three spreads regularly moved 20,000 cubic yards of dirt per 10-hour day, completing a 1,300,000-cubic-yard job by early October.

#### Make deep cut

On this same section, Moorman excavated more than 500,000 cubic yards of material from a 65-foot cut—the deepest on the turnpike. This job in itself required three months since 70 per cent of the material was rock.

Where the rock was sufficiently soft, it was ripped with a LeTourneau K-30 ripper pulled by a Caterpillar D8 or an International TD-24 or both. A spread of seven Euclid scrapers

hauling the material from the big cut into fills as far as a mile down the right of way were helped on the loading cycle by a Caterpillar D9 and Allis-Chalmers HD-20 push tractors.

Where the rock had to be drilled and shot, a number of rigs were used, including two Ingersoll-Rand wagon drills powered by a Gardner-Denver 600-cfm compressor, an Allis-Chalmers HD-14 tractor with a drill attached, and a Mack truck which carried an Ingersoll-Rand drill and a Schramm compressor. The toughest of the rock was loaded by a Bucyrus-Erie 54-B shovel into four Euclid bottom-dumps.

Two Caterpillar D8 tractor-dozers shaped the fill as it was compacted by an International TD-24 and an Allis-Chalmers HD-20 tractor, each pulling three big Gebhard sheepsfoot rollers. Caterpillar No. 12 motor graders handled finishing.

Another spread, working from a large borrow pit on this same section of the turnpike used a Euclid loader pulled by an International TD-24 and an Allis-Chalmers HD-20 to load earth into a fleet of 13 Euclid bottom-dumps. Of the 20,000 cubic yards per day moved by the three spreads on this section, half was handled by the "Euc" loader and bottom-dumps.

To supply the many thousands of gallons of water needed to compact all of this material in the fills, Moorman converted five of the older Euclid bottom-dumps into water wagons by welding the doors and fitting the boxes with side boards and tops. These wagons could haul from 4,700 to 5,000 gallons per load.

#### Prepare base for fills

While crews were finishing the Big Cabin section, another spread of scrapers was breaking ground on a site some 15 miles to the northeast. The rolling country of this section made the grade a series of cuts and fills, with the volume of fill far exceeding the available cut. Additional material for the embankments was obtained from borrow pits on adjoining land, each contractor making his own arrangements for obtaining the borrow material.

Scrapers starting a new section first removed the sod and topsoil from both the cut and fill areas and stockpiled it for use later in dressing the slopes. As soon as a fill area was stripped, an International TD-18A tractor moved in with an Amco disk and scarified the entire surface, using only one section of the heavy disk.

An International TD-24 tractor

More than 500,000 cubic yards of material is being excavated from this 65-foot cut, the deepest on the turnpike. A Caterpillar D9 tractor with a torque converter pushloads a Euclid scraper, as it picks up a load of dirt.

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pulling a Gebhard three-drum sheepsfoot roller followed the disk compacting the subgrade, which was to be the base of the fill. Producing a pressure of 450 psi empty, the sheepsfoot rollers were ballasted with water to increase pressure to about 550 psi.

Push-loaded by Caterpillar D9 and International TD-24 tractors, the spread of five Euclid scrapers then dug into the cuts and spread the material in thin layers on the fills to be watered and then rolled by sheepsfoot rollers. On all fills, each lift of 3 feet was test rolled with a Ferguson 50-ton roller pulled by a Caterpillar D8 tractor.

After the cuts were completed, the rigs moved into the nearest borrow pit to get the remainder of the material for the fills. Borrow pits on this



section were relatively close to the cuts, so the average hauls were less than a half mile.

The top foot of the subgrade was built of a select material, a disintegrated sandstone, obtained from a pit

near the right-of-way and loaded by a Bucyrus-Erie 54-B shovel into a fleet of Euclid bottom and end-dumps. The "Eucs" dumped the material on the base where it was spread in 6 to 8-inch layers by two motor

A Gardner-Denver pump, powered by a GM diesel engine, pumps water from the borrow pit for use on the road. The 3,750-gallon tank-trailer pulled by an International truck hauls the water four miles from the pit to the grade.  
C&E Staff Photo

graders, an Adams 610 and a Caterpillar No. 12.

Since part of this sand pit was filled with water, Moorman set up a Gardner-Denver pump powered by a GM diesel engine beside the pit to obtain water for compaction. The unit pumped to a Euclid 4,500-gallon water wagon and a 3,750-gallon tank-trailer pulled by an International truck. These rigs hauled as far as 4 miles up and down the road from the pit.

After each lift of select material had been spread by the graders and watered to optimum moisture content, it was compacted by the sheepsfoot rollers to produce a finished subgrade ready for paving.

In this area north of Vinita, Moorman graded two sections with a total length of 11 miles, including the interchange at Afton. About 10 per cent of the 2,200,000 cubic yards of excavation and borrow required on these sections was rock which was scarified with a Caterpillar ripper and loaded by the scrapers. Also included in these sections were box culverts requiring 3,000 cubic yards of concrete and 2,400 linear feet of concrete pipe culverts in sizes from 24 to 42 inches. The bridges were not included in the grading contract.

#### Mobile radio links jobs

With as many as five or six spreads of equipment at work on sections scattered over more than 30 miles of the turnpike, Moorman used a Motorola mobile-radio system to coordinate the jobs. Mobile units in the cars of six foremen and superintendents kept them in constant communication with each other and with the base station at the field office near Big Cabin.

Although work on these sections being built by Moorman was substantially completed late last fall, many other contractors continued grading operations throughout the winter in order to have the subgrade ready for the paving contractors this spring. Bridge construction also continued without letup during the winter months.

#### Personnel

Consulting engineers on the design and construction of the sections graded by Moorman were Hudgins, Thompson, Ball & Associates, Oklahoma City, and Wyatt B. Hendrick of Lawton. William Dale served as resident engineer for HTB&A, and Robert B. Hendrick represented Hendrick as resident engineer. Superintendents for J. W. Moorman & Son were Wallace B. Keene, Jr., and J. R. DeWitt. Foremen in charge of the several spreads included Troy Jackson, Paul Tuggle, H. E. Williams, and Joe Musgrope. W. D. Hoback is chief engineer and manager of the Oklahoma Turnpike Authority.

THE END

CONTRACTORS AND ENGINEERS

**NOW!**

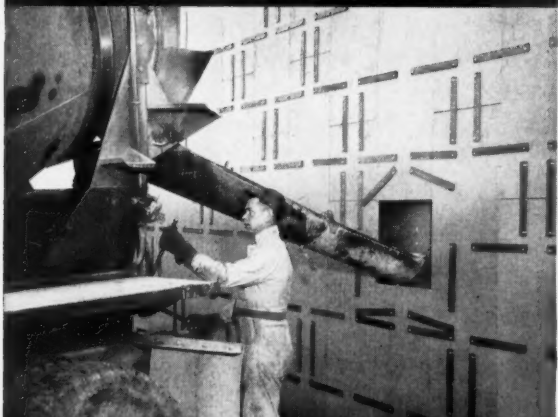
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Here's a new and patented way to build concrete forms, perfected and proven over a 3-year period by independent contractors, that now cuts labor costs on heavy construction forms from 45¢ per sq. ft., using other types of forms, to only 5½¢ the FormCo way. This simpler, faster method uses only 1½" plywood panels equipped with special fasteners and employs steel clamps for joining members. There is no limit on foundation size or height. Lengths may be controlled to 1/16". The wall panels, fastener hardware, and supporting clamps may be used over and over. Panels are interchangeable. Inner and outer walls may be constructed separately or simultaneously to speed assembly. For greater height flexibility, panels and clamps are usable horizontally or vertically. As illustrated, any panel is removable for easier pouring access or inspection. Forms may be constructed to any height by detaching bottom panels after the concrete sets up. The rigid construction insures accurate self-alignment of the form . . . results in smoother finished walls.

#### SAVES FABRICATION, CONSTRUCTION TIME

The FormCo method has been engineered to save on-the-job construction time . . . minimize fabrication necessary before materials are shipped to the job site. The 7- or 9-ply wall panels are pre-drilled and pre-fitted with special, rust-resistant fasteners at the city nearest the construction job to reduce shipping and handling costs. The fasteners, consisting of a tapped and threaded bolt, are counterbored into the plywood and held by a nut. The formed steel clamps, which join the panels and hold the snap ties, are quickly and easily bolted to the fasteners at the job site. No walers or nails are needed. Since there is no protruding surface hardware, materials require about 75% less storage and truck space than average forms. Panels, with pre-fitted hardware included, are sold by the square foot in a range of sizes to meet any job requirement. Both plyform and overlaid plywood panels are available.

**formCo, inc.**

ROCKFORD TRUST BLDG., ROCKFORD, ILL.

For more facts, use Reader-Reply Card opposite page 18 and circle No. 239



# Re-use of forming hurries work on twin bridge for pike

**Form panels, prefabricated at the site,  
enables contractor to build 12 piers  
simultaneously for parallel spans**

With a schedule of only 240 working days and a penalty of \$400 per day liquidated damages for failure to complete the job on time, no time could be wasted in building a pair of bridges to carry the Oklahoma North-eastern Turnpike over the Verdigris River. Without waiting for one pier to be well started, E. E. Barber Con-struction Co., Inc., Fort Smith, Ark., contractor on the job, began work on the next one so that within a few weeks, crews were working on all 12 piers of the twin bridges.

Starting the job in the last week of July, 1955, Barber had the 12 piers ready for the steel girders by Octo-ber, and hopes to have the entire structure completed this month, two months ahead of schedule. To speed the work, pier forms were fabricated on the ground, and two cranes placed concrete simultaneously. Five cranes were working on the job all the time, and work was so organized that every man and every machine always had a place to work and a job to do.

The contractor for this \$1,213,000 project, E. E. Barber, was at the site most of the time to help keep opera-tions at peak efficiency.

Designed by Lee H. Hendrix Engi-neering Co., Tulsa, Okla., bridge con-sulting engineer for the Oklahoma Turnpike Authority, the Verdigris River spans are a parallel pair of continuous steel-deck girder bridges spaced 100 feet apart, center to center. Each of the almost-identical bridges has a 30-foot roadway flanked by curbs 9 inches high and 2 feet 10 inches wide which carry aluminum railings. Each bridge, 994 feet long between abutments, consists of seven spans supported on six piers and two-abutments. The spans range from 122 feet at the ends to 210 feet at the center.

## Founded on rock

The heavy-stemmed T-shaped piers are founded on solid rock, which at the maximum was 62 feet below the surface of the ground. The abutments are supported on 12-inch 53-pound steel bearing piles 65 to 70 feet long driven to bearing in the rock.

Each bridge deck consists of four 8-foot-high continuous steel girders spaced 9.67 feet apart. A reinforced concrete slab 7½ inches thick spans between the girders and overhangs 3½ feet on each side to form the complete deck.

As soon as the first crane arrived on the job, Barber started excavating for the pier footings. The holes were first clammed out to depths of 12 to

(Continued on next page)

For more facts, circle No. 240→



Steel for the bridge is set by two Link-Belt Speeder LS-98 cranes. The long spans are spliced in the field, and the longest single piece to be raised is about 90 feet. The maximum lift is 25 tons.



STANDARD MC-3 Cut Back Asphalt is applied to Boulder County Highway 10. Standard Asphalt engineer Oscar Jones (left) and Highway Superin-tendent Douglas N. Stewart check application.

## Ordering STANDARD Asphalt

*makes job easier for Boulder County  
Highway Department*

Boulder County Highway 10 in Colorado links the city of Longmont with State Highway 66 three and a half miles to the west. It is a popular highway for travel to Rocky Mountain National Park and for farm-to-city traffic. Maintenance of this highway in first class, all-weather condition is made easy by the use of STANDARD Asphalt. The Boulder County highway department gets these benefits from ordering asphalt requirements from Standard: (1) top quality product and (2) an assured source of supply.

And there are still more advantages to ordering asphalt from Standard Oil. Standard's experienced asphalt salesmen know the needs of road builders and are qualified to work with them in planning requirements. Standard Oil has long experience as an asphalt supplier, knows what it means to protect customers on supplies and deliveries.

You can get these advantages when you buy asphalt from Standard. Find out. Call your nearby Standard Oil Office in any of the 15 Midwest and Rocky Mountain states, or contact Standard Oil Company, 910 South Michigan Avenue, Chicago 80, Illinois.



As the link between Longmont and State Highway 66, Boulder County Highway 10 gets plenty of traffic. To take this traffic, road is surfaced with STANDARD Asphalt.

Highway 10 running west of Longmont, Colorado to State Highway 66 is 24 foot wide, asphalt surface, all weather highway. Standard Oil's Oscar Jones and Highway Superin-tendent Douglas N. Stewart inspect road recently resurfaced.



STANDARD OIL COMPANY (Indiana)



(Continued from preceding page)

25 feet before sheeting for the cofferdams could be set. Using a McKiernan-Terry 9-B-3 steam hammer, the crane then set and drove the M-116 steel sheet piling. To permit work to be carried on in several holes at the same time, Barber rented 350 tons of the sheet piling from L. B. Foster Co., Pittsburgh, Pa.

The cofferdams, ranging from 36 x 26 feet to 46 x 30 feet, were framed with double 8 x 16 oak stringers and 12 x 12 oak struts. Frames were spaced as close as 3 feet at the bottom, and the deepest holes required seven sets of framing. To seat the deepest pier, the cofferdam was sunk through about 40 feet of topsoil and clay, 8 feet of sandy soil, 7 feet of cemented

gravel, and then from 4 to 10 feet into the underlying shale.

When the sheeting was set, excavation continued by clamming between the struts of the frames. Workmen using clay spades powered by Worthington 105-cfm compressors trimmed the excavations and dug out material that the clam could not reach.

The excavation into the shale was made by drilling and blasting. Ingersoll-Rand jack hammers powered by the Worthington compressors drilled 1 3/4-inch holes about 4 feet deep for the blasting. A core trench was first cut out through the middle of the pier, and the sides were then blown in toward this trench. A small amount of line drilling was required, and the excavations were trimmed with air-powered demolition tools.



By the time the job was well under way, an exceptionally large spread of equipment was at the site, including four cranes—two Link-Belt Speeder LS-98 models and two LS-90's in addition to a Koehring 304. These

cranes used Williams and Page 3/4 and 1-yard buckets for excavations and Insley 1-yard concrete buckets for placing concrete. Sheet piling was driven by a McKiernan-Terry 9-B-3 hammer and pulled with a Vulcan No.



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FARRELL'S "85" STEELS  
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WITH 30" BELLS  
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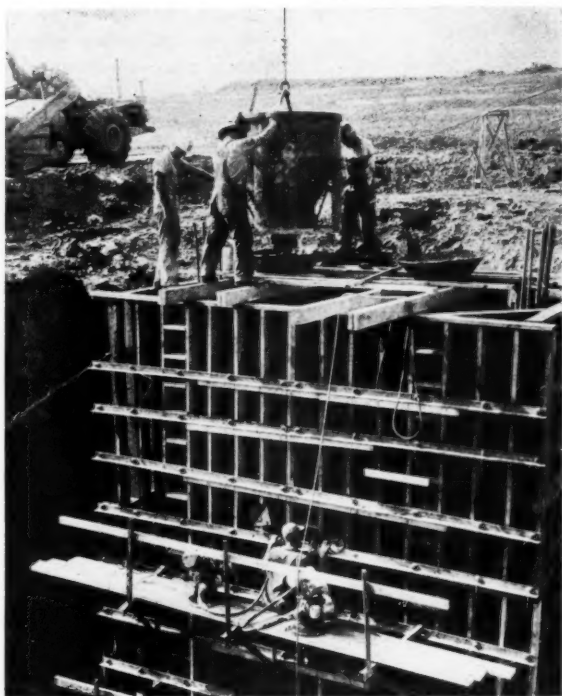
For more facts use Reader-Reply Card opposite page 18 and circle No. 242

**CONTRACTORS AND ENGINEERS**



Koehring 304 crane with Wil-  
¾-yard clamshell bucket exca-  
vates a cofferdam. Excavation for  
bridge piers goes down to solid  
inside the cofferdams of steel  
piling. C&E Staff Photos

As the concrete is fed into a  
tremie from the Insley bucket,  
the concrete in the forms is vi-  
brated by Vibro-Plus mechan-  
ical units. The vibrator cables  
reach deep into the pier stem  
through a hole in the forms.



"... the Master goes faster than the mixers."

"Our Master Screed is a one-man-gang. It does everything at once, faster than we've done it before. We've upped our schedules and really cut our costs."

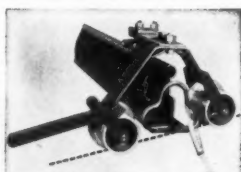
General contractors and road builders say that, because in one time over, the Master Vibrating and Finishing Screed strikes off, vibrates and compacts—from top to bottom—even the lowest slump concrete, making a denser, stronger slab than any other way we know of.

It eliminates honeycomb and form work on bridge decks, molds the concrete in crowns, arcs or flat for roadways and cuts 'way down on finishing time for any slab. This cost-cutting, top-quality screed is inexpensive and economical to operate. Available with arc or flat. See your Master distributor today for complete information.

Retractable Wheels Standard Equipment On Vibratory Screed



Screed in operating position. When lever is up, screed rests on work surface, ready to go. Gives high speed strike-off, compaction, and finish.



**MASTER**

**MASTER VIBRATOR COMPANY**  
1752 Stanley Avenue • Dayton 1, Ohio

For more facts use Reader-Reply Card opposite page 18 and circle No. 243

800 pile extractor. A Vulcan No. 1 steam hammer drove bearing piles for the abutments.

Although water in the cofferdams was not a major problem, it was necessary to use a 2-inch pump in each of the deep excavations. Simultaneous construction of several piers kept three Rex and five Worthington pumps busy. Other equipment included a Caterpillar D7 tractor-dozzer, several Vibro-Plus concrete vibrators, and many small tools and attachments.

#### Forms are prefabricated

Because of the similarity of the piers, many of the form assemblies could be re-used 8 to 12 times. A typical pier consisted of a 34×26-foot footing 7 feet thick sunk from 4 to 10

feet into the rock. From the footing, the stem measures 9½×14 feet for the next rise of 23½ feet, 8½×13 feet for the following 20 feet of height, and 7½×12 feet for the top 16 feet of the stem. The cap, which forms the cross of the T, is 4 feet wide, 34 feet long, and tapers from 9 to 7 feet in depth. Although their exact dimensions vary somewhat, all piers have the same general shape.

Panels for the forms for the pier stems were prefabricated of ¾-inch plywood backed with 2×6 studs and 3×3×¾-inch steel angle wales. Bolted to the sections, the wales were kept in place throughout the many reuses.

Not only were the form panels prefabricated, but the form assemblies for a complete lift of the stem were

## NEW LETOURNEAU TREE STINGER!



## OUT BY THE ROOTS!

ONE-STEP REMOVAL OF BIG TREES SPEEDS CLEARING FOR AGRICULTURE OR RIGHT-OF-WAYS

More than just a powerful new machine—the LeTourneau Tree Stinger brings an entirely new system to the slow and expensive job of removing big trees for agriculture or right-of-ways. The Stinger uses tons of pressure to push a tree out by the roots—leaving no stumps for later removal.

**LeTourneau diesel-electric power does it!** Powerful electric motors raise, lower, extend and retract the pusher boom. Every movement of the giant machine is controlled by small finger switches of the LeTourneau electrical control system. Self-generated power moves the Stinger from tree to tree ... job to job.

**Electric Wheel mobility.** LeTourneau equipment can work where other big machinery can't even go because each wheel drives, steers and brakes ... has its own powerful drive motor and gear reduction. Extra wide-base rubber tires provide traction and flotation

for the Stinger over rough ground or through mud.

**Other new LeTourneau land-clearing equipment.** Write today for full information on the Stinger, the mobile



Force of Stinger's boom literally pushes trees out by the roots.

Tree Saw, and the Tree Crusher ... LeTourneau machines for systematic and profitable land clearing, manufactured by R. G. LeTourneau, Inc., Longview, Texas—makers of BIG equipment since 1929.



**R. G. LETOURNEAU INC.**

2436 South MacArthur

Longview, Texas, U. S. A.

R. G. LeTourneau, Inc.

2755 South MacArthur

Longview, Texas, U. S. A.

Please send me information on the LeTourneau Tree Stinger and other land-clearing machinery.

Please send me Bulletin 21 on the LeTourneau Tree Saw.

Name \_\_\_\_\_

Company \_\_\_\_\_

Title \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_

Country \_\_\_\_\_



Distributorships available in several countries—write today!

6105

For more facts use coupon, or Reader-Reply Card opposite page 18 and circle No. 244

also assembled on the ground ready to be set in place on the pier. The workmen who assembled these units, never any higher off the ground than the height of the lift, used one crane to set up the panels and tied them together with  $\frac{3}{8}$ -inch steel form rods locked to the wales with Medco cat-heads. The crane then picked up the entire assembly and set it in place. As soon as the assembly was tied down to the preceding lift, it was ready to pour.

When the forms had been stripped, the tie rods were cut off 1 inch in the concrete and left in place. The several panels making up the form unit were returned to the assembly yard where they were cleaned, recoiled, and reassembled for another use. This method not only saved the climbing necessary in assembling form panels in place, but also permitted the workmen to assemble form sections well in advance of the time they would be used.

#### Two cranes place concrete

As soon as a form was ready for concrete, two of the cranes were positioned on opposite sides of the pier for the concrete-placing operation. Two tremies with funnel tops were placed in the form, and each crane bucketed concrete to one of the tremies. Ready-mix concrete, delivered to the job by the American Concrete Co., Claremore, in Smith 6-yard mixers carried on GMC 500 trucks, was discharged into Insley 1-yard bottom-dump concrete buckets which were swung to the forms by the cranes. With this arrangement two of the ready-mix trucks were being unloaded at the same time. Concrete was placed at a rate of 25 to 40 cubic yards per hour, a rapid placement for bridge piers.

A series of access holes were left open in one side of the form when the concrete was being placed in deep lifts. A scaffold was provided on the outside of the form below the elevation of each of these holes to support two Vibro-Plus concrete vibrators and the workman who tended them. The flexible shafts of these mechanical vibrators were inserted through the holes, and the vibrators were operated by workmen inside the form. By means of these holes, the workmen were in constant visual and oral contact with the man on the scaffold.

As the level of the concrete inside the form rose, the holes were closed and the vibrators moved up to the next platform.

The concrete mix for the piers contained 1 part cement to 2.22 parts sand and 3.33 parts coarse aggregate. No admixtures were used in the concrete for the piers, but an air-entraining agent was added to the same mix for use on the deck section. The twin bridges required 6,800 cubic yards of concrete in which 750,000 pounds of reinforcing steel was used.

The 1,750 tons of structural steel were furnished by American Bridge Div. of U. S. Steel Co., Birmingham, Ala., and Robberson Steel Co., Oklahoma City. Using the Link-Belt Speeder LS-98 cranes, Barber set the steel with his own crew. The long



Forms for the stems of the piers are completely assembled and tied on the ground, and once the base is ready, they will be set in place by a crane. Panels, lined with  $\frac{3}{4}$ -inch plywood backed with 2 x 6 studs, are re-used many times.  
C&E Staff Photo

spans were spliced in the field, so that the longest single piece of girder to be raised was about 90 feet, and the maximum lift was approximately 25 tons.

Forms for the concrete deck were built up from the lower flanges of the girders, with the cantilever slabs on both sides supported by needle beams attached to the lower flanges of the girders. Plywood, used for all decking, was on 2 x 8 joists.

Grading of the approaches to the bridge, which required 85,000 cubic



George D. Fox, president, George D. Fox & Co., Baltimore, made this simple test, found Littleford best.

#### COMPARISON OF BITUMINOUS DISTRIBUTOR FEATURES

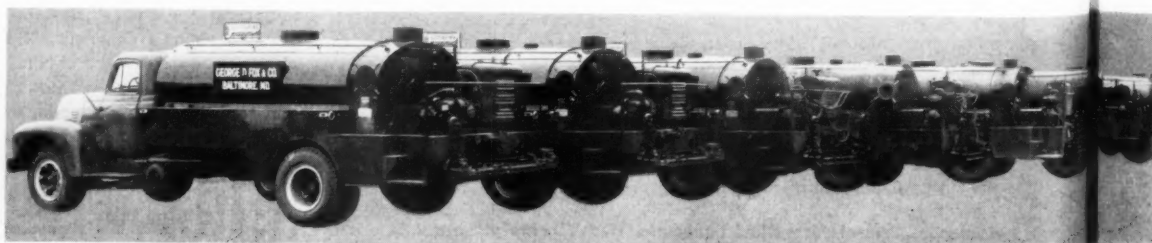
	Littleford Spray Master	Distributor A	Distributor B	Distributor C
Multi-pass continuous heat flue system.....	Yes	Yes	No	No
Patented damper.....	Yes	No	No	No
Air-cooled flue liner.....	Yes	No	No	No
Patented single valve control.....	Yes	No	No	No
Right-angle drive.....	Yes	No	No	Yes
4-speed transmission.....	Yes	No	No	No
Full area circulating spray bar.....	Yes	No	No	No
Hydraulic spray bar lift.....	Yes	No	No	No

### Contractors compare and find

## LITTLEFORD SPRAY MASTER TOPS IN BITUMINOUS DISTRIBUTORS

George D. Fox & Co. operates a fleet of 14 Littleford Spray Masters. Like many other progressive contractors, Mr. Fox compared the rest and found Littleford best . . . for the 8 big reasons listed in the chart above.

Contractors everywhere like the exclusive Littleford combination of design, construction and operating advantages that mean better faster and lower cost spraying.



### LITTLEFORD

the world's most complete line of completely engineered black



KETTLES • EMULSION SPRAYERS • HEATER-PLANER-SURFACE HEATER • BITUMINOUS DISTRIBUTORS • BITUMINOUS MIXERS • ROAD BROOMS • ROLLERS • PAVES-SPREADERS • SUPPLY TANKS

CONTRACTORS AND ENGINEERS



yards of borrow material, was sublet to W. E. Logan & Sons, Muskogee. Most of the material for the approach fills was obtained by widening and straightening the river channel in the vicinity of the bridge.

#### Personnel

Superintendent of the job for the E. E. Barber Construction Co., Inc., was Charles W. Surbey, and E. E. Barber himself was on the job a good deal of the time. Resident engineer Wayne E. Miller represented the Lee H. Hendrix Engineering Co., consultants to the Oklahoma Turnpike Authority on the design and construction of some of the turnpike bridges.

W. D. Hoback is chief engineer and manager of the authority.

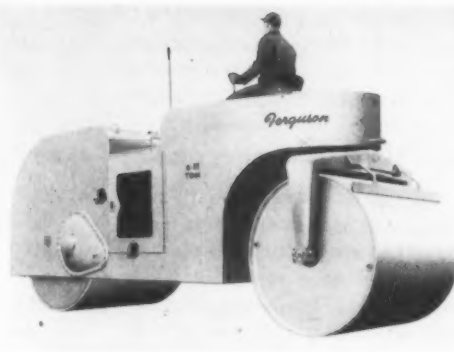
THE END

#### Wire reinforcement

■ Resurfacing airports, roads, highways, and streets with asphaltic concrete is more economical and durable with welded wire fabric reinforcement, according to a folder from the American Steel & Wire Division of the United States Steel Corp. Some of the advantages claimed for the welded wire fabric include equal distribution of truck load, binding of plastic asphalt, and elimination of washboarding. The step-by-step process of applying the fabric is described.

To obtain Form No. 6536 write to American Steel & Wire Division, United States Steel Corp., 1420 Rockefeller Bldg., Cleveland 13, Ohio, or use the Request Card at page 18. Circle No. 52.

The compression roll of the new Ferguson variable-weight tandem roller delivers a pressure of 287 psi when ballasted with water.



#### Variable-weight roller has one-piece frame

■ An 8 to 12-ton variable-weight tandem roller has been announced by the Shovel Supply Co. Equipped with a one-piece steel frame, the Ferguson roller is powered by a 6-cylinder gaso-

line or diesel engine. It utilizes an Allison torque converter, a two-speed transmission, and instantly reversible clutches.

The transmission, combined with the torque converter, permits an infinite variety of speeds up to 5½ mph. A 200-gallon water tank holds the ballast.

Rolls are constructed from high-carbon steel plate. The compression roll is 60 inches in diameter and 54 inches wide. Ballasted with water, the machine produces a pressure of 287 psi.

For further information write to Shovel Supply Co., 4900 Hines Blvd., Dallas, Texas, or use the Request Card at page 18. Circle No. 79.

#### Easy-to-handle buggy has 13½-foot capacity

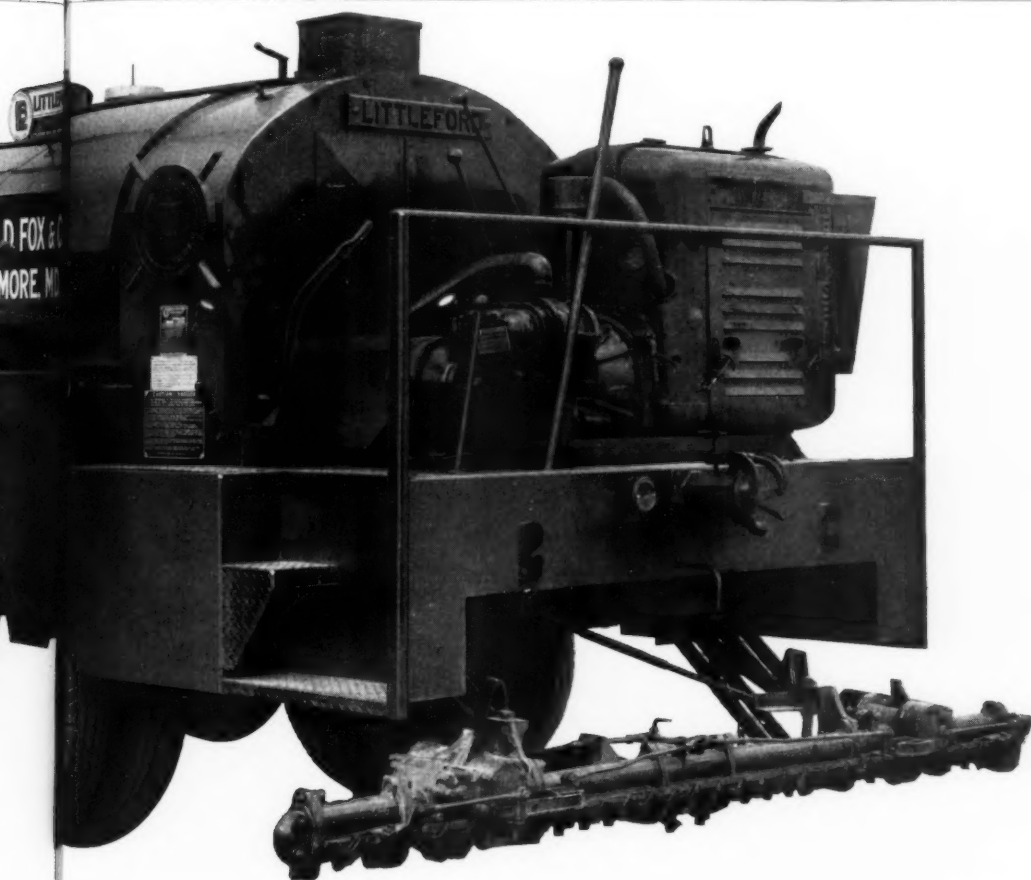
■ Creative Metals Corp. has added a power buggy to its line of cement placing and finishing equipment. According to the manufacturer, the new Cmetco power buggy is safe and easy to handle and has excellent ramp maneuverability, being able to turn around within a radius of its own length.



Incorporating an automotive-type drive and instantaneous direct shift from first to reverse, it can be safety-lock braked while carrying a maximum load. The buggy is climb-load rated at 1,450 pounds on a 35 per cent grade and 2,250 pounds on a 25 per cent grade. Heaped capacity is 13½ cubic feet and maximum travel speed, when empty, is 17 mph.

Among its features is a compound transmission with built-in multi-disk double oil-type clutch which gives constant gear mesh and eliminates foot-clutch control.

For further information write to Creative Metals Corp., 1290 Powell St., Emeryville, Calif., or use the Request Card at page 18. Circle No. 125.

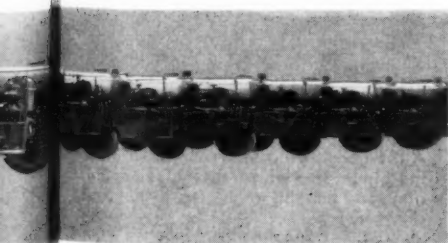


Here are just two of the many time-saving features that will save you up to an hour a day:

- (1) patented damper saves 30 minutes on starting time. It blocks off the entrance to the flues, concentrates heat within the heat chamber, thus heating the pump, main valve and piping faster than any other unit.
- (2) 2-section full area spray bar heats to spray temperature faster, saves 5 minutes on every load.

The Littleford Spray Master gives you a single patented valve control, hydraulic operated bar lift, 4-speed transmission and many other operating advantages.

Compare Littleford Spray Master . . . you'll buy Littleford Spray Master. For complete information, send today for bulletin 14. Littleford Bros., Inc., dept. LB 205, 485 E. Pearl St., Cinti. 2, Ohio.



black top equipment



For more facts use Reader-Reply Card opposite page 18 and circle No. 245

The new CCS Wooldridge Cobrette has capacities of 7.5 cubic yards struck and 10 cubic yards heaped.

### New 10-yard scraper also serves as pusher

■ The Cobrette, a new 10-yard self-propelled scraper said to have many design features available for the first time in this class of equipment, is announced by the Wooldridge Mfg. Division of Continental Copper & Steel Industries, Inc.

These new features include fluid coupling drive, a positive-power Gear Steer actuated by hydraulic rotary cylinders, and a specially designed frame and power train which permits one unit to aid in push-loading another.

Rated at 7.5 cubic yards struck and 10 cubic yards heaped, the 143-hp diesel-powered unit has speeds up to 30 mph. It is equipped with four 18:00 x 25 tires for ample flotation and traction. Versatility and ease of operation under widely varying conditions are said to be achieved by the unique power train which includes the fluid coupling, air-actuated clutch and transmission, and a readily accessible gear transfer case.

The Wooldridge Gear Steer is said to provide maximum safety, ease of



operation, and maneuverability of full 90-degree steering. It consists of two powerful hydraulic rotary cylinders mounted on the scraper yoke and geared to the large vertical kingpin on the tractor.

Scraper design incorporates the

standard CCS Wooldridge principles of "boiling bowl" loading, rear fulcrum leverage, positive full-power pivot-tilt ejection, and low bowl profile with high ground clearance.

The entire front end, tractor frame, and power train were specially designed for pushing, enabling two or more Cobrettes to assist each other in loading. The units are recommended by the manufacturer for use as a one-man team, in fleets, or to supplement other equipment in all-around service, close quarter jobs, cleanup, and other operations requiring compact maneuverability, high speed, and loading with or without pusher assistance.

For further information write to the Wooldridge Mfg. Division, Continental Copper & Steel Industries, Inc., Sunnyvale, Calif., or use the Request Card at page 18. Circle No. 129.

## NEW-Dodge offers you a complete line of tandem-axle models



### New Dodge bogie unit guarantees you maximum payload capacities!

Now you can get Dodge dependability and low operating costs in a complete line of rugged, all-new six-wheelers.

**Capacity ratings** range from 25,000 to 46,000 G. V. W., rear-axle capacities from 22,000 to 38,000 lbs.

**High-power V-8 engines**—from 201 to 220 hp.—give you more than enough power to haul the heaviest loads easily, speedily, safely.

**"Walking-beam" bogie** keeps all eight rear tires in contact with ground at all times, minimizes bounce, increases tire mileage.

**See these new V-8 Dodge tandems.** Check them out against any other make and discover why they top the industry.

**GET YOUR  
DODGE DEALER'S  
DEAL BEFORE  
YOU DECIDE**

**DODGE** Job-Rated **TRUCKS**  
WITH THE FORWARD LOOK

For more facts use Reader-Reply Card opposite page 18 and circle No. 246

### Tubeless or regular tire handled by new changer

■ A tire changer for both tubeless and regular truck tires on all drop-center wheels and rims from 17.5 to 24.5 inches has been announced by the Bishman Mfg. Co. According to the manufacturer, the No. 932 truck tire changer enables one man to do the same work as four men handling the job manually.

A power-driven rotating arm mounts and dismounts the tires. The machine operates on the floor. In mounting, the arm slides the bead over the rim without touching the air seals. In dismounting, a tire iron starts the bead over the rim, and the arm lifts the bead off with one rotation of the wheel.



A tire iron is used to lift the bead onto the blade of a power-driven removing arm on the Bishman No. 932 tire changer.

The tire changer has an electric motor that operates on 110 to 220 volts and an air chuck that operates on 140 to 175 pounds of air pressure. A double-power air cylinder is available for low-pressure lines.

For further information write to the Bishman Mfg. Co., Osseo, Minn., or use the Request Card at page 18. Circle No. 128.

CONTRACTORS AND ENGINEERS





The Blue Brute WTN-18 tamper.

### New tamper permits work in 10-inch-wide ditches

■ A new Blue Brute WTN-18 triplex ditch tamper has been placed on the construction machinery market by the Worthington Corp. According to the manufacturer, design and narrow construction of the new tamper permits triplex tamping of ditches as narrow as 10 inches in width.

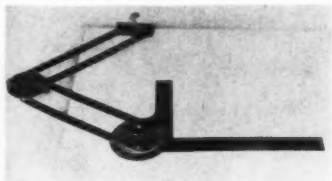
Made of heat-treated steel, the medium-weight-class tamper utilizes three W-18's, and is rigidly mounted on a triplex frame. Adjustable handlebars on an extension pipe permit operators to tamp ditches up to 48 inches deep while working at ground level.

For further information write to the Worthington Corp., Worthington & Harrison Aves., Harrison, N. J., or use the Request Card at page 18. Circle No. 107.

### Compact drafting device for field sketching

■ A simple drafting device which eliminates the necessity of carrying rulers, protractors, T-squares, and triangles into the field for routine sketches is marketed by David Miller & Associates, Beverly Hills, Calif.

Made of anodized aluminum, the instrument can cover an area 11x17 inches, yet fit snugly into a man's



pocket. It is a precision instrument with all scales machine-calibrated to 0.0005 inch, and scientifically engineered to retain its original accuracy. The Draftette clamps to a drawing board or sketch pad quickly.

The new device offers precision, versatility, and convenience in one compact instrument that folds like a jackknife, and though it is feather-light in weight, it is designed to withstand hard normal use.

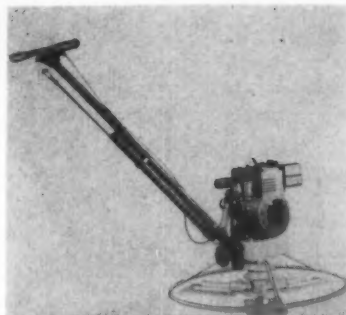
For further information write to David Miller & Associates, P. O. Box 572, Beverly Hills, Calif., or use the Request Card at page 18. Circle No. 134.

This new 44-inch power trowel is the heavy-duty member of the Muller line.

### Add two new models to line of trowels

■ The Muller Machinery Co. has announced two additions to its line of power trowels. In addition to 29 and 34-inch-diameter machines, 24 and 44-inch-diameter models are now available.

Muller power trowels have stationary guard rings for easy finishing along baseboards, and are equipped



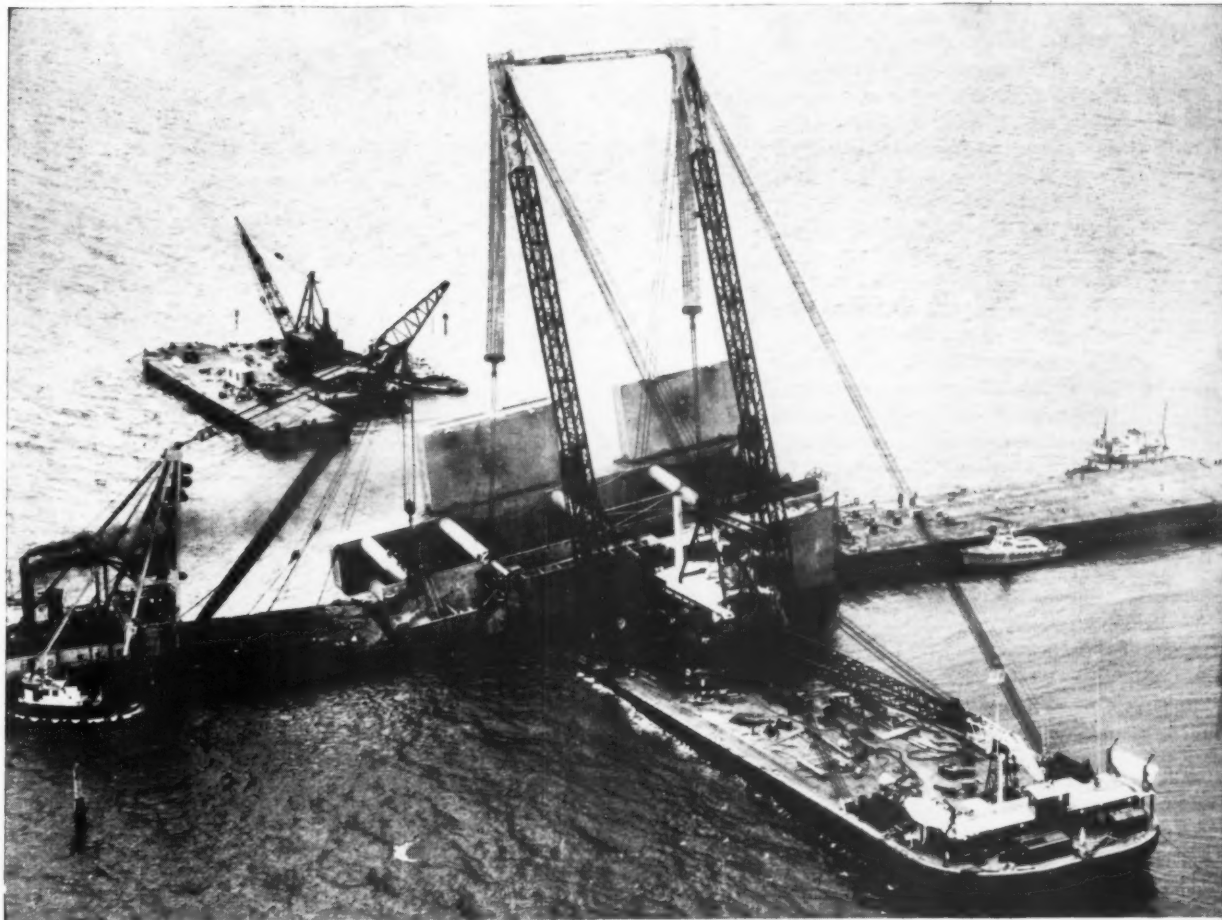
with positive declutching mechanism so that the engine may be started be-

fore the blades are thrown into action.

For further information write to Muller Machinery Co., Inc., P. O. Box 248, Metuchen, N. J., or use the Request Card at page 18. Circle No. 126.

### Railway engineers elect

William J. Hedley, assistant chief engineer of the Wabash Railroad, has been elected president of the American Railway Engineering Association. He succeeds G. M. O'Rourke, an assistant maintenance engineer of the Illinois Central Railroad.



## 800 tons test the mettle and merit of wire rope

This mighty J. Ray McDermott & Co. Derrick Barge No. 8 lifts a free load of 800 tons—a world's record. Here it is righting a 3,000 ton oil drilling barge capsized in the Gulf of Mexico.

The rope selected for this 800-ton stiff-leg derrick and for the 150-ton revolver derrick is HERCULES Red-Strand—nearly 9 miles of it—ranging in size up to 2½ inch diameter. HERCULES Red-Strand was selected, too, for the sister craft McDermott Derrick Barge No. 9. These mighty assignments offer proof of outstanding service—well and economically performed.

Wire rope users know from experience that HERCULES Red-Strand delivers durability and economy on all types of equipment—on ordinary size machines, as well as on colossal equipment such as McDermott Barges Nos. 8 and 9. In all industries, HERCULES Red-Strand offers premium service and performance—without premium cost. It will serve you, too, in the same dependable way.

### VITAL STATISTICS

Dimensions.....90' x 300'  
Stiff-leg Capacity.....800 tons 70' from aft  
Load lines.....10,300' each—1½"—6x19  
Blocks.....40 parts  
Boom Hoist Lines.....4100' each—1¾"—6x19  
Side guys & backstays.....2½"—6x19  
Revolver Capacity.....150 tons at 80' radius  
Barge built by.....Avondale Marine Ways, Inc.  
Derrick by.....American Hoist & Derrick  
Wire rope by Leschen—HERCULES Red-Strand—through  
Reliance Machinery & Supply Co.

# LESCHEN

## HERCULES Red-Strand® WIRE ROPE



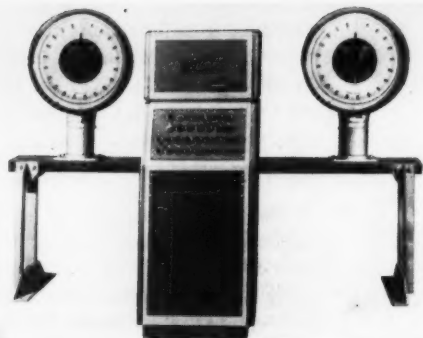
A Leschen distributor is nearby—  
to give you prompt attention.

LESCHEN WIRE ROPE DIVISION  
H. K. PORTER COMPANY, INC.

St. Louis 12, Missouri



For more facts use Reader-Reply Card opposite page 18 and circle No. 247



### Electronic batch system works with punched cards

■ An electronic weigh batching system that works in conjunction with IBM punched cards has been perfected by The Heltzel Steel Form & Iron Co. Called the Helco-matic Batchmaster, the new unit is housed in a compact console no larger than a standard filing cabinet.

Through the use of IBM punch cards, the unit instantly and automatically selects and weighs out the precise amount of any number of materials. The combinations of material weights and selections are unlimited and can be changed instantaneously. Where repetitive batches are required, the Helco-matic provides for automatic recycling. A moisture-compensating feature enables the Helco-matic to eliminate the problem of compensating for moisture by weight. A simple control regulates the moisture percentage to the amount desired.

The Helco-matic has a controlled closed circuit that is said to practically eliminate the possibility of malfunctioning due to vibration, moisture, or dust. Pushbuttons for all controls are provided for manual batching of individual materials.

To facilitate maintenance and keep downtime to a minimum, all major components of the machine have been grouped and set on individual drawers which can be quickly removed, or mounted on panels that swing into a position for easy repairing.

For further information write to Heltzel Steel Form & Iron Co., Warren, Ohio, or use the Request Card at page 18. Circle No. 32.

### Tentative size, weight limits for road bill

Tentative approval has been given to the size and weight "freeze" contained in the Fallon Bill for an expanded national highway construction program, by the House Public Works Committee.

The section outlining the "freeze" stipulates that vehicles exceeding specified size and weight limitations must be prohibited from using interstate system routes if the states are to qualify for Federal interstate system funds. Only vehicles not exceeding the size and weight established as a maximum by state law or by the American Association of State Highway officials on April 1, 1946, would be able to use the routes.

The Helco-matic Batchmaster batches materials according to specifications coded on IBM punched cards.

### Iron-powder electrode for ac or dc welding

■ A new iron-powder-type electrode designed for ac or dc operation in all positions is announced by Hobart Bros. Co. The iron powder in the coating is said to permit welding at higher currents to increase deposition rates over conventional E-6014 type electrodes.

According to the manufacturer, the Rocket 14 electrode features an arc which is soft and stable in all positions. There is no tendency to stick on either ac or dc. The contour of the weld is easily controlled by the arc length; a short arc increases the convexity, and a long arc decreases the convexity. The weld bead is smooth, slag is easily removed, and there is

very little splatter, the company reports.

Hobart's Rocket 14 comes in 1/8, 5/32, 3/16, 7/32, 1/4 and 5/16-inch sizes packed in 50-pound packages, and a 3/32-inch size in 25-pound packages.

For further information write to the Hobart Brothers Co., Hobart Square, Troy, Ohio, or use the Request Card at page 18. Circle No. 146.

### E. A. Drott dies

The founder and senior chairman of the board of the Drott Tractor Co., Inc., and Drott Mfg. Corp., E. A. Drott died suddenly on April 5, in Raleigh, N. C., at the age of 69. He had been a pioneer in the field of expanding the usefulness of crawler tractors.



SWINGING 18-YARD CABLE-DUMPED, TANDEM-AXLE SEMI-TRAILERS, these rugged GMC Diesels haul away 21 tons of clay at a clip—right to the limit of the Michigan weight laws. This 70,000 GCW model is one of a complete line of GMC Blue Chip heavy duties meeting every hauling need in the 59,000 GVW-90,000 GCW

range. Especially designed for tough construction jobs, these new GMC's are extra-stamina-engineered—are equipped with new oversized axles. When required for exceptionally severe service, full-length channel frame reinforcements are obtainable as factory-installed option.



## Track-type shovel-crane is 3-yard, 75-ton unit

A 3-cubic-yard shovel, the K-608, has been announced by Link-Belt Speeder Corp. This latest addition to the Link-Belt excavator line is the company's largest production model to date.

The crawler-mounted K-608 is convertible to shovel, crane, dragline, clamshell, and piledriver operation. The machine has a rated crane lifting capacity of 75 tons at 12-foot radius.

A feature spotlighted by the manufacturer is the Speed-o-Matic true-power hydraulic control, a fingertip-operated, quick-response system that is said to permit up to 25 per cent greater output than is possible with similar sized machines having man-



Link-Belt Speeder's new K-608 crane has a 75-ton rated lifted capacity.

## "Our 10 GMC Diesels hauled 1 million yards in 2½ years — with engine maintenance of only \$40 a truck!"

Sugden & Sivier have worked some of Detroit's biggest construction projects. One of the toughest was hauling away 400,000 yards of soggy blue clay on the John C. Lodge Expressway job. To keep things moving, every load had to be heaped right up to Michigan's 70,000 GCW limit. And five of the ten miles to the dump point were through fuel-eating city traffic.

Clearly, Sugden & Sivier had to have trucks that could take a lot of punishment—keep rolling—keep costs down. Past experience gave the nod to GMC Diesels. So their bid was based on the expected performance of 10 new tandem tractors they stood ready to order.

"We knew GMC's could handle the oversize loads," says Grant L. Sivier. "We've never seen anything like them for sheer brute-strength. Yet there's not an ounce of 'fat' in their design to waste our allowable road-

weight. And it was GMC Diesels' economy that let us bid as low as we did."

Actually, the 10 new GMC's did even better than expected. Over the entire first year of use, engine repair costs averaged just \$11 per truck. And fuel mileage—despite the 42,000-lb. loads and stop-and-go traffic work—was a smart 4.7 m.p.g.

Today—2½ years later—Sugden & Sivier's GMC Diesels still deliver 4.7 m.p.g. They've each hauled 97,500 yards of payload—clocked about 100,000 miles apiece. Yet total engine maintenance costs of all 10 trucks still come to less than \$400.

Want economies like these on your jobs? There's a cost-cutting GMC Blue Chip tandem—gasoline or Diesel—engineered for any truck-work up to 59,000 GVW—90,000 GCW. Check your requirements now—with your GMC dealer!

GMC TRUCK & COACH—A General Motors Division



TOP TONNAGE AND TIGHT SCHEDULES ARE NO PROBLEM to this fast-stepping GMC Diesel. Its power comes from a new cost-cutting 2-cycle Diesel engine—one of a great new line of Blue Chip power plants engineered to take the toughest truck-work in stride. They include a wide choice of gasoline and Diesel models.



AT WORK ON AMERICA'S TOUGHEST JOBS, Blue Chip GMC's are chalking up standout performance records—and earning record profits—for many a leading contractor. Extra-powered engines—extra-capacity axles—and extra-tough construction throughout—make these GMC's the top choice for punishing jobs.

For more facts use Reader-Reply Card opposite page 18 and circle No. 248

ual controls. Standard power equipment consists of a torque converter and engine which are matched for greater horsepower output, and consequently greater production, during the digging cycles. The converter also provides for closer control and smoother operation in crane work.

Both the upper and lower frames are all-welded and stress-relieved to insure maximum strength and life under severe shock-loading conditions, according to the company. All shafts are easily accessible for quick, easy inspection and maintenance. An independent, positive chain crowd offers two crowding speeds. Boom angle changes are permitted without chain adjustment.

The K-608 has a ground clearance of 18 inches on the seven-roller frame model and 24 inches on the nine-roller frame type. These clearances reportedly are possible since the traction shaft assembly is completely enclosed, without underhang, within the lower frame.

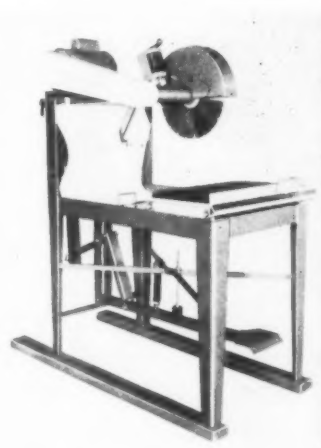
An optional independent rapid boomhoist is available for fast, safe, continuous booming with heavy loads. Hydraulic-controlled clutches are said to make booming more precise and keep the boom within the operator's control. A high retractable gantry, quickly lowered to reduce over-all clearance height when required, is available for operation with a long boom.

For further information write to the Link-Belt Speeder Corp., 1201 Sixth St. S. W., Cedar Rapids 1, Iowa, or use the Request Card at page 18. Circle No. 140.

## New masonry saw takes blades up to 14½ inches

Diamond Tool Associates has announced a new masonry saw for wet or dry cutting. Designed for a blade capacity of up to 14½ inches, the saw is said to be for use on all kinds of masonry and ceramic materials.

Special features reported are a new



The Diamond masonry saw.

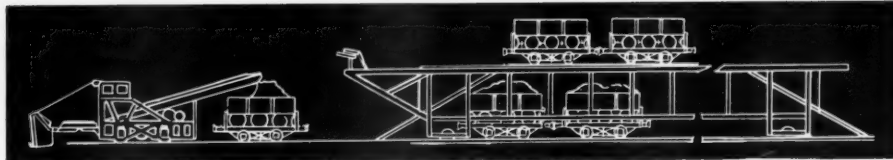
self-priming pump, elimination of dust problems when used as a wet-cutting saw, and factory-greased bearings. No height adjustments are necessary, according to the maker.

For further information write to Diamond Tool Associates, P. O. Box 85, 940 E. El Segundo Blvd., Hawthorne, Calif., or use the Request Card at page 18. Circle No. 37.

A heading is a digging face and its work area.

When the shaft has reached the level of the proposed tunnel floor, two headings are started, one in each direction along the line of the tunnel. In addition, the foot of the shaft may be greatly expanded for storage and maneuver space, and one or more rooms may be built to house compressors, pumps, and other plant equipment.

At first only a single set of tunnel-driving equipment may be used, as there will not be space enough for two, and greatest efficiency will be obtained by drilling at one face while mucking at the other. Room for two sets will be made very quickly, but alternate work is sometimes continued until the distance between



Grasshopper over-head switch for muck cars.

## Tunnel work . . . Drilling and mucking

(Continued from last month)

headings is great, or sometimes for the whole job.

Drilling patterns may be similar to those described for shafts—wedge or burn holes and successive rings breaking into the crushed-out area. The whole face is usually drilled and

blasted in one operation (full-face attack), but a small tunnel (drift) may be drilled full-face, blasted, and cleaned out, then enlarged by radial drilling; or the top may be kept ahead of the bottom (bench-and-heading method).

Shafts may be partly or wholly replaced by a small pilot tunnel, driven parallel and close to the main tunnel. Crosscuts are driven from this to the main tunnel wherever new headings are to be started. The main tunnel is opened up with a center drift, and enlargement started after it is cut through enough so that both tunnels can be used for traffic.

The extra tunnel may be used for ventilation, both during the work and afterwards. It permits a great many operations to be performed at the same time, and may save considerable expense in sinking shafts. This method has been used chiefly for long railroad tunnels through mountains where depth was too great for shafts.

### Drilling

The standard tool for small tunnel drilling has been the drifter, a medium-weight hand drill with a hand or automatic feed, mounted on a vertical column or a horizontal bar of such length that it can be secured between the floor and roof, or between the sides, by screw-jack ends. Because of the weight of the columns, they become impractical for full-face work in tunnels of greater cross section than 10×10 feet. It is now being replaced by hydraulic boom mountings.

Larger tunnels were formerly done by the heading-and-bench method. This permits the use of drifters on short columns for the advance, and approximately vertical jackhammer or wagon drilling for the bench. Sometimes the heading is extended far ahead of the bench, and has its own hauling equipment that dumps over the bench face into other cars, or into a pile to be dug away.

Now the standard method is to use a drill carriage (jumbo), on which power-feed drills can be mounted so as to reach all parts of the face at correct angle and to correct depth. Each drill usually does several holes. It can be positioned by hand, or by mechanical, air, or hydraulic controls. Such jumbos may be constructed to straddle hauling equipment, so that they do not interfere with removal of muck. They may also carry a cherry picker crane to pick up empty cars and to switch loaded ones through. They are backed away from the face before each blast.

On very large tunnels jumbos may be used on both levels of heading-and-bench work.

Usual drilling depth is 10 to 12 feet, but in any case is seldom deeper than two-thirds the smallest dimension of the tunnel.

Recently tunnel drilling has been

your only assurance of  
**CONTROLLED QUALITY—**  
in neoprene and  
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For more facts, use coupon, or Reader-Reply Card opposite page 18 and circle No. 249



*This is the fourteenth in a series of articles consisting of excerpts from the 1,280-page book, "Moving the Earth," by Herbert L. Nichols, Jr., published in March of last year. Priced at \$15, the book is available through the Book Order Department of CONTRACTORS AND ENGINEERS, 470 Fourth Ave., New York 16, N. Y. A copy may be ordered on approval by circling No. 1 on the Request Card at page 18. Approval copies will be billed at \$15 plus postage.*

partly standardized to use steels threaded to carry detachable bits. These may be multi-use types that can be sharpened and reshaped by hot milling; one-use or throwaway bits that are discarded when dull; and carbide-insert bits. In some mines carbide-tipped steels are used, while in others the old fashioned steel with the business end forged into a bit is still employed.

The carbide-insert bit has caused a spectacular advance in speed and ease of hard-rock tunneling. Many tunnel men say there is no such thing as hard rock any more. Carbide outwears steel at an average of about 100 to 1, and gives much more rapid hard-rock penetration. The time of handling, transporting, and processing bits is reduced from a major to a minor problem.

#### Loading

Water-resistant explosives with good fume characteristics are desirable in underground work. These qualities are found in gelatin dynamites.

When all holes in a face have been drilled, each is blown out with a high-pressure air jet to remove loose cuttings and water. Cartridges are slit (unless the explosive is damaged by water and the hole is wet) and tamped firmly with a wooden pole. It is common practice to place the primer after the first cartridge, with the cap pointed toward the collar of the hole.

Stemming may be taken from the drill cuttings. It is most convenient to use if wrapped in paper bags of the same size as the cartridges. If this material is very high in silica, its use as stemming might increase the silica in the air enough so that prewrapped blanks supplied by powder manufacturers might be preferred. There are also wood and rubber plugs that are very satisfactory.

It is good practice to place a wad of paper between the explosive and the stemming, so that the powder can be easily and safely located in case of a misfire.

There is danger of premature explosion from stray currents. A common precaution is to take down or "kill" all electric wiring within five hundred feet of the face before starting to load. Safety flashlights, (hand or cap models), or headlights from a battery locomotive can be used. It is sometimes a question whether the poor lighting obtained does not offer as much of a hazard as the electricity would.

Even the complete absence of electricity on the job would not guaran-

tee a tunnel face against currents, as underground water is often highly mineralized and will conduct a charge for long distances. Metallic ores may

be excellent conductors.

Any wiring hookup can be used, depending on the preference of the blaster. If 440-volt electricity is available, it is preferred for firing, although 220 or even 110 will do. Regular blasting machines are also used, but they should not be kept in the tunnel when not in use, because of possible damage from dampness.

All equipment is moved 500 to 1,000 feet back from the face, as rocks caroming off the walls can travel long distances. Compressor pipe can be let fairly close to the blast, but ventilation conduit must be stripped way back.

Move-back requirements may be

reduced by a portable metal buffer wheeled into place or set up on the jumbo before the blast.

It is important that a thorough check be made after the blast for misfires. Tunnel work brings a large number of men into close contact with the heading, and any accidental explosion during mucking or drilling would be disastrous. The best check is inspection by experienced men.

If an unexploded hole is found, and the wires are intact, they can be hooked up and fired. If the wires are missing, the stemming can be washed out by a water jet, and a new primer inserted and fired. Or a parallel hole, about two feet away, can be drilled,



**GOING UP** to 14 stories! 9000 cubic yards of concrete plus hundreds of tons of construction materials were moved by an American 3-drum hoist during construction of this modern building.

## GOING UP, RIGHT ON SCHEDULE

The hoist on a big job like this gets a real workout—buckets and elevators going up and down hundreds of times a day! Just one hoist breakdown can throw the whole job off schedule! A dependable hoist keeps jobs rolling. That's why tough American Hoists are demanded on all jobs where there's no time for trouble! Anti-friction, self-aligning bearings cut wear to the bone. Machined gears give smooth power flow and job-proved clutches and brakes mean safe load control! All these American Hoist features, plus many more, add up to give you years of trouble-free, low cost hoist operation on every job, regardless of size.

If you want the contractor's story, stop at the next job where you see an elevator at work—it's almost certain to be powered by an American! Ask the owner, and operator too, what they think of their American—then see your American Distributor for details about a line that starts with capacities of 3,000 pounds single line pull!

**AMERICAN HOIST**  
and Derrick Company

St. Paul 1, Minnesota

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loaded, and fired. The muck must be inspected for unexploded cartridges.

#### Mucking

In small tunnels blasted rock may be dug by hand, although the excellent mechanical loaders adapted to work in tight quarters, that are now available, and the rising price of labor are steadily reducing the practice. Output for the loading gang is generally figured at about  $\frac{1}{2}$  to  $\frac{2}{3}$  yards per hour per man, although one man may load up to 2 yards under favorable conditions.

The swell or "growth" of rock in passing from the solid to the blasted state averages about 50 per cent. In tunnels, mucking is usually calculated in terms of loose yards.

Slick sheets should be used in connection with hand loading. These are thin steel plate,  $\frac{1}{4}$  or  $\frac{5}{16}$  inch, in pieces about 4x6 feet, with holes punched for convenience in picking up for moving. They are laid to cover the tunnel floor for 10 to 25 feet back from the face before each shot. Large rocks are picked up and thrown into the cars individually, while the finer material is dug by shovels that slide easily along the metal surface.

Mechanical loaders include full revolving shovels with short booms and proportionately larger buckets, that move either on crawlers or rails, and until very recently used only air or electric power. There are also railroad-type shovels, that use one track and load cars on another beside it, and may have a cherry picker for changing cars on the back.

Special tunnel-mucking machines are available in large variety. Most of them are rail-mounted, although crawlers are gaining in popularity. The bucket can be swung from side to side to reach the full floor area, and is filled by pushing into the pile.

It is then lifted, in some models, over the machine to discharge into a car conveyor belt behind; in others it loads a built-in conveyor that discharges to the rear. In either case, the car may be coupled to the mucker so that it is always in loading position.

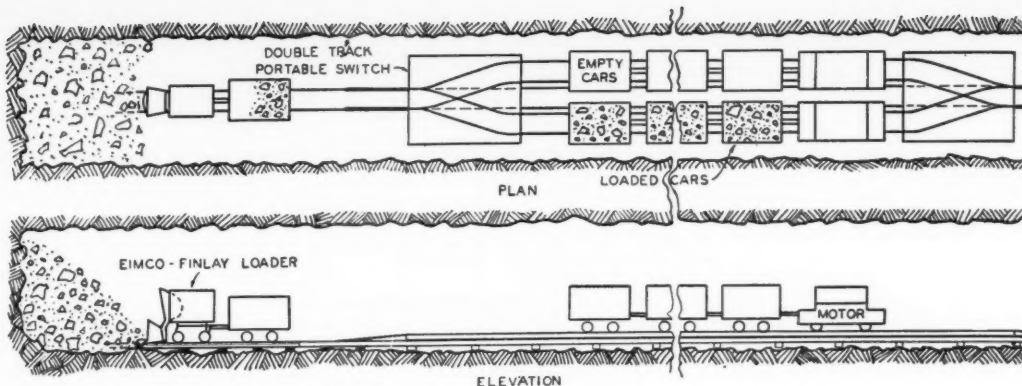
Slushers are drag-scraper units that usually have a metal slide to support and guide the open-bottom bucket and its load. The slide may be long enough to accommodate several empties in addition to the one being filled.

Another drag-scraper method employs a trap fitted with grizzly bars to support the bucket. In this case the train comes through at right angles to the scraper slide and is moved as each car is filled.

The scraper tail block must be anchored on the far side of the digging. If this is the face, a bolt or flexible fitting is usually wedged into a drill hole in it. If at an intermediate point in the tunnel, it may be attached to a timber by a hook or tongs.

#### Hauling

Any type of hauling unit may be used in a tunnel, from a wheelbarrow to an off-the-road ten-wheeler. It is a matter of tunnel size, speed of driving, ventilation, and preferences of the management.



The traditional system is small muck cars pulled along narrow-gage tracks by electric locomotives. The locomotives can take power from either batteries or high lines, and

range in weight from 4 tons up. There is an increasing use of diesel locomotives with exhaust conditioners in well ventilated tunnels.

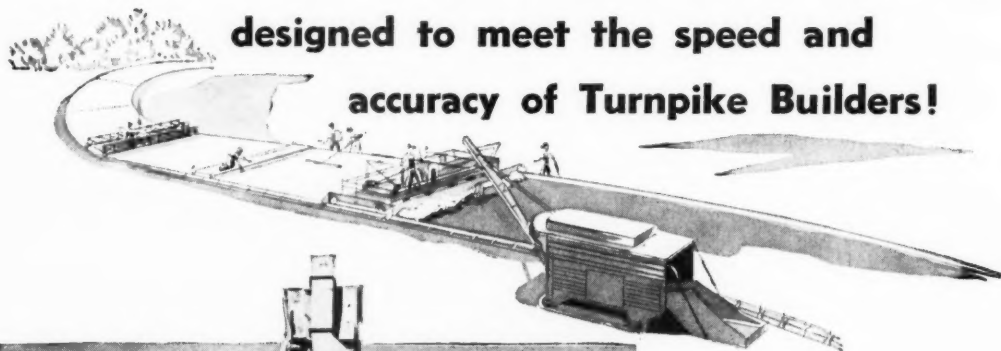
Cars are usually side-dump types,

although many special constructions are found. The width is governed by the tunnel and the gage of the track, and should be small enough to allow passing in the tunnel. Car width is

## Strictly for Production

### New Heltzel Batchmaster Plants

designed to meet the speed and accuracy of Turnpike Builders!

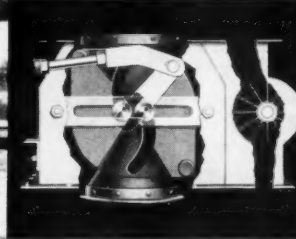


HERE are the paving plants the industry has been looking for! Big capacity Heltzel Batchmaster Production Paving Plants that have the portability, speed and accuracy to more than meet modern day work schedules and job specifications.

Let's look at the Standard E-3 Automatic Cement Batchmaster. Of flare leg design, to permit easier truck access, the plant has the exclusive Heltzel combination gravity vane cement charger (below) that means the fastest, most accurate batching yet possible. Designed for fast, easy dismantling, it easily comes within the dimension limitations for over-the-road hauling. The plant itself will hold up to 609 bbls. of cement. Add Heltzel's high speed recirculatory system and this capacity can be expanded to over 1600 bbls. Smaller size recirculators also available.

A perfect mate to the E-3 is the Type 200 Batchmaster aggregate plant. It is a sturdily built, portable plant that holds a full 200 tons. Yet it can be quickly dismantled into four sections for transporting from one location to another. It is compartmented to suit requirements. It will carry the largest batchers made, including Heltzel's exciting new electronic unit.

If your program for this year calls for the placement of a large quantity of concrete, these plants will save their initial cost in short order. Before you buy equipment, let us show you their many advantages. And remember, it costs no more to own Heltzel Batchmasters—so why not operate with the finest.



The amazing Heltzel Combination Gravity Vane Cement Charger that permits cement batching with a speed never before attained, to an accuracy that has rewritten the record books. It's standard equipment on all automatic Batchmaster plants.

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Portable switch arrangement  
tunnel muck cars.

generally about twice the track width.

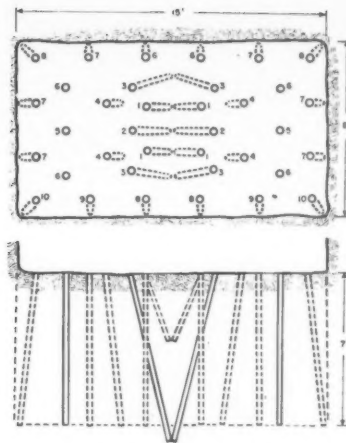
The capacity of the car may be limited by switching arrangements. If they are pushed by hand, capacity is limited to 1 or 2 yards, as heavier cars will need to be pried along the tracks, rather than shoulder-pushed. The car must be low enough to go under the discharge of the mucking machine being used. If hand loaded, it must not be over 4 feet high.

The loaded muck cars are hauled to the shaft and run into hoisting cages, in which they are lifted to the top, where they are dumped by side tip-

ping. There are also special cars that can be lifted directly, without entering a cage. Or they may be dumped at the bottom into a hoisting skip.

The perpetual problem in tunnel haulage, which becomes more acute as size decreases, is bypassing the empty cars (or trucks) going to the face around the full ones coming away from it. Empty cars may be switched to the side, or if they are small, be lifted or pushed off the track by hand, where there is space for only one track. Larger ones may be handed by a cherry picker.

The locomotive pulls a string of empties into the heading and stops to let the cherry picker take up the rear-most car and set it aside. The locomotive then backs far enough so that the car can be replaced on the tracks



Large-tunnel drilling pattern.

in front of it, then pushes that car up the loader. While it is being loaded, it backs so that another car can be picked off.

When the car is loaded, the locomotive couples to it and backs past the cherry picker, which places the empty in front of it to be pushed to the face. While it is loaded, the rear empty is again set aside, to be pushed in on the next cycle. When all the cars are filled in this manner, the locomotive pulls them to the shaft.

In a tunnel of sufficient height, a movable framework called a grass-hopper can be used. This allows the empty cars to be moved over the loaded ones, and can be pulled up to the face by the loader.

A conveyor belt may be set up so that a full train of cars can be backed under it, and loaded one by one from the front back.

Conveyor belts can also be set up to haul from the face to the shaft. No switching arrangements are required, but this unit cannot be used readily to bring supplies from the shaft to the face; considerable work is involved in dismantling or protecting it for a blast; and there is constant work adding sections to keep it in touch with the digging.

Diesel-powered trucks are increasing in underground popularity. They carry much bigger loads than mine cars, and if sufficient width is available to make passing possible, they get past each other with fewer complications than rail-mounted carriers. The shuttle types, such as the Dump-tor, which are equally comfortable going backward or forward, are often better adapted to the work than those which have to be turned in the tunnel.

The use of internal-combustion engines fouls the air, so that very good ventilation is required.

#### Exhaust gas

The exhaust from a gasoline engine contains carbon monoxide, an odorless but poisonous gas that soon makes any closed-in place deadly to life. Amounts of monoxide that are not sufficient to cause unconsciousness or death may temporarily damage judgment and reasoning power, causing an increase in danger of accidents.

Diesel exhaust contains little monoxide, but it is rich in various chemi-

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MAY, 1956

cals that smell badly, are irritating to eyes and throat, and that fog up the air so that visibility is dangerously reduced. This last difficulty is increased by the usually bad lighting in a tunnel.

The danger from gasoline-engine exhaust has largely prevented use of this type of power underground. Diesels are finding increasing use in spite of the irritation and danger they cause. Their presence is partly compensated by increasing the ventilation, but conditions do become very bad. They are often made worse by an astonishing lack of care in adjustment of the engines. Diesel trucks sometimes emerge from tunnels belching black smoke, presumably caused by defective or souped-up injectors, that would justify arrest of the driver on an open highway.

Various types of scrubbers using water and chemicals to dissolve and neutralize gases, and secondary catalytic oxidizers that serve also as mufflers, are used to make internal-combustion engines acceptable underground.

Good ventilation and lots of it is a basic requirement, even when such devices are efficient. The most they can do is reduce the exhaust to carbon dioxide and water. Carbon dioxide is not poisonous or irritating, but in sufficient concentration, it has a suffocating effect that can cause impairment of judgment, unconsciousness, and even death.

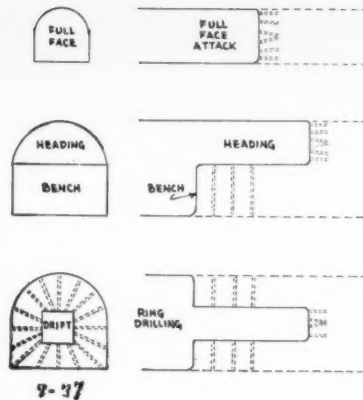
#### Water

Ground water is a problem in most tunnels, and may be the principal one in some. Many mining tunnels, some of them miles in length, are made solely to lower the water table. There may be seepage all along the line, adding up to a considerable volume to be drained or more often pumped away. Gushing springs may be exposed by any blast, or may open up from seepage points well behind the face. Underground lakes or rivers may be encountered that are capable of flooding the work in spite of continuous pumping. Veins of soft water-soaked soil may be found in hard rock, and may break into and fill the tunnel.

The first necessity is to have adequate pump capacity. The tendency is to underestimate requirements, largely because pumps and lines are expensive, partly because even careful exploration from the top seldom reveals the full quantity and pressure of water that may be encountered.

If a tunnel runs uphill from a portal, drainage may be by natural flow through a ditch cut along the side. If an upgrade from a shaft, it can be drained to a pump inlet at the shaft foot. This arrangement is easy and inexpensive, but seldom satisfactory, because of repeated blocking of the ditch by rock falls from walls or from hauling equipment, resulting in water running over the floor, making it sloppy and often undermining the track or spoiling the road surface. The ditch also takes up more space than a pipe.

The conventional arrangement is to pump all water. A small centrifugal



Tunnel headings.

pump, usually air-driven, is kept near the face. This takes from a sump and discharges into a pipe running back toward the portal or shaft. Sumps are provided every 500 to 1,500 feet back

to collect local water for another centrifugal, usually electric-powered. Each pump may discharge into the sump behind it, which is kept down by another pump, usually of a larger

size. Another arrangement is to have all pumps discharge through check valves into a common discharge line. A powerful electric pump of the piston or centrifugal-jetting type is installed at the shaft bottom, and as many boosters as are required for the lift installed at intervals in niches in the shaft.

The pump or pumps at the base of the shaft are sometimes placed in a sealed room, with power and control directly from the shaft top. In other cases the pumps are in the open, but are of the submersible type. These arrangements permit use of the units along with emergency pumps if the tunnel should be flooded.

Water inflow can often be checked by grouting. This may be done by drilling deep into the rock in the di-

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rection of the supposed source of the water, sealing in pipes with cement, and then pumping in cement and water grout—either straight for seepage or mixed with sawdust or shavings for gushing flow. This may be done in advance of the tunnel-driving in very wet areas, by fanning the grout holes out from the face and edges of the heading.

Grouting is also done through completed linings, either to check water or to fill in spaces between it and the wall. Grout pipes may be cemented into a concrete lining when it is poured.

Successful grouting of a wet seam sometimes merely diverts the water so that it enters the tunnel at another point that was previously dry. This also may be grouted, but a point may

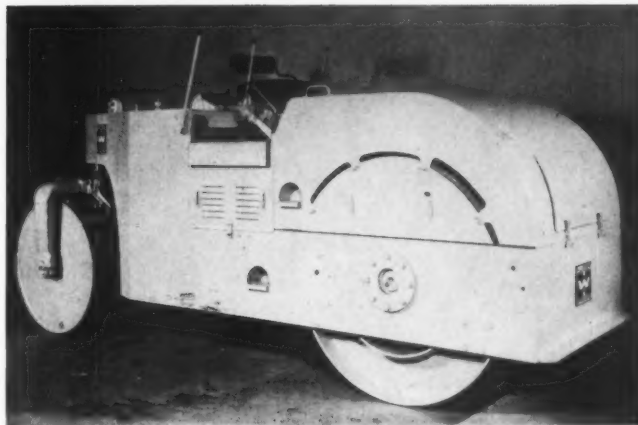
be reached where the contractor either installs a complete concrete lining, or gives up the effort to seal off and relies on his pumps.

(To be continued next month)

### Crane Carrier merges with Standard Industries

A merger has been effected between the Crane Carrier Corp., Tulsa, Okla., manufacturer of heavy-duty trucks, and the Standard Industries, Inc., of Pennsylvania, New York, N. Y., a holding company. The merger will increase the working capital of Crane Carrier and will permit the firm to expand its Tulsa plant.

Crane Carrier, Ltd., of Canada, a subsidiary of the Tulsa organization, was not affected by the merger.



Huber-Warco's four new variable-weight tandem rollers are equipped with torque converter.

### New tandem roller line with torque converter

The Huber-Warco Co. has announced a completely new line of medium and heavy-duty variable-weight tandem rollers featuring torque converter and two-speed transmission as standard equipment. The new line includes 5-to-8 and 8-to-10-ton rollers and 8-to-12 and 10-to-14-ton tandems.

On all four machines the torque converter more than doubles the available power and supplies it instantly when needed, according to the manufacturer. Other benefits are said to include a decrease in fuel consumption; longer life of the engine; forward-reverse clutches and other machines components; and elimination of shock loads, stalling, over-loading, and the need for a master clutch.

Through use of a tail shaft governor, the roller automatically maintains the speed set by the operator, regardless of the grade encountered.

Huber-Warco has linked the torque converter to a specially designed two-speed transmission to get increased efficiency and more economical operation, particularly at slow rolling speeds. The combination of a torque converter and two-speed transmission makes the correct gear ratio available to meet any work load, the company reports.

Another feature of the new Huber-Warco tandem line is a completely adjustable guide roll assembly to eliminate road "scuff". Both the kingpin and swivel pin are held in alignment by tapered roller bearings which can be easily adjusted in the field to prevent road scuffing caused by looseness. Also, the steering arm is splined—not keyed—to the top of the kingpin to spread the shearing load around the entire circumference of the pin.

Other important features of the new tandem line include the removable kingpin mounting; two completely independent braking systems; a variable-speed hydraulic steering system; unusually close curb clearance; a final drive mounted in the frame, instead of on it, to assure precision meshing of gears; a cooling system which draws clean air from above the rear end of the roller; an all-welded frame with corners double-welded and braced; and a choice of gasoline or diesel power in all models.

For further information write to the Huber-Warco Co., 202 N. Greenwood St., Marion, Ohio, or use the Request Card at page 18. Circle No. 135.

# LOAD AND LESS COSTLY MECHANISM WITH THE HIGH VOLUME DUMP TRAILER!

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For more facts, use coupon, or Reader-Reply Card opposite page 18 and circle No. 252



The Novo concrete breaker is available with four types of heads for various applications.

### Concrete breaker employs 2,500-pound drop hammer

■ The Novo Pump & Engine Co. has announced that it is again manufacturing the Novo concrete breaker for use in repair of concrete roads, bridge flooring, and other concrete surfaces, and in cutting pavements for trenches, water and sewer lines, and cables.

The breaker can be mounted on any truck from 1½ tons up. Four types of heads for various applications are available. All are fastened to the hammer by means of U-bolts.

The machine is powered by a CWR-133, 4-cylinder, 30-hp engine through a multiple V-belt drive. A 2,500-

pound drop hammer and a single-drum Novo hoist with 12×16-inch drum operated with screw thrust are utilized.

For further information write to the Novo Pump & Engine Co., Lansing 5, Mich., or use the Request Card at page 18. Circle No. 74.

### Steel sprockets, chains

■ Three catalogs from Taylor-Wharton Iron & Steel Co. detail its line of manganese steel chains, sprockets, and parts. Replaceable tooth segments on the sprockets are pictured. Chains described include detachable, conveyor, elevator (for handling stone, shale, cement, and the like), pintle, and drag-conveyor types. Manganese parts shown are for cone and jaw crushers, pulverizers, and similar equipment.

To obtain these catalogs write to Taylor-Wharton Iron & Steel Co., 5083 Beech St., Cincinnati 12, Ohio, or use the Request Card at page 18. Circle No. 102.

### Announce swing stage with safety features

■ Announcement of a new swing stage has been made by the Waco Mfg. Co. The new stage, capable of carrying loads up to 650 pounds per machine, has three features which are said to insure absolute safety of operation: a self-energizing brake which prevents loads from running down; a pawl on the gear drum which maintains working position; and a crank which locks against the winch frame.

The Waco safety stage is built of steel, and all parts subject to severe strain are high-grade tensile steel. Steel gears are machined and all wearing parts are hardened and ground. A spur gear drive raises the machine. The drum holds 100 feet of ¼-inch aeronautical cable.

For further information write to the Waco Mfg. Co., 3555 Wooddale Ave., Minneapolis 26, Minn., or use the Request Card at page 18. Circle No. 123.

## Take a look inside the truck industry's newest V8!

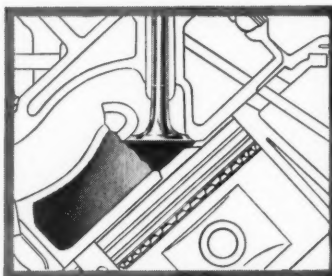
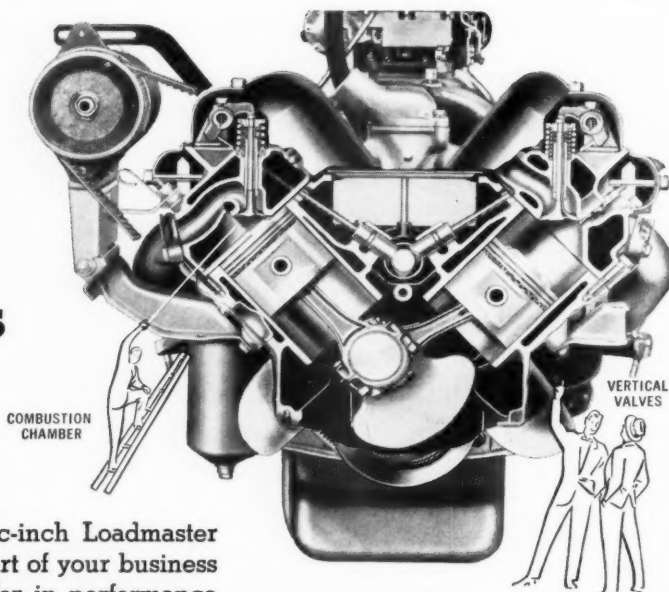
It's Chevrolet's new 322-cubic-inch Loadmaster V8... and if big trucks are part of your business you'll find it has plenty to offer in performance and economy!

What you see inside that new V8 is modern engine design at its best! The new Loadmaster is a true heavy-duty load puller, with 310 ft. lbs. of torque and a fuel-saving compression ratio of 7.7 to 1. Extra-rugged components work together with perfected precision to produce 195 h.p.—plenty of reserve power to ease your toughest pulls!

Evidence of great engineering is everywhere in this most powerful of all Chevy truck engines. It offers the *shortest stroke* of any engine in its class; thus, engine wear is minimized, good economy assured. And it's the most compact of big-truck

engines—delivers highest horsepower per pound. That's proof of *more efficient* design. Spark plugs are mounted centrally in the inverted "V" combustion chamber to give maximum heavy-duty power on regular fuel. Advanced features such as hydraulic valve lifters, chrome-plated top ring, and full-flow oil filter mean longer engine life with less maintenance expense!

And there are many, *many* such reasons why you'll do better with this new load-pulling champ under the hood! For all the facts, see your Chevrolet dealer... Chevrolet Division of General Motors, Detroit 2, Mich.



Vertically mounted valves give high fuel-air turbulence during the compression stroke... you get maximum power from every drop of fuel!

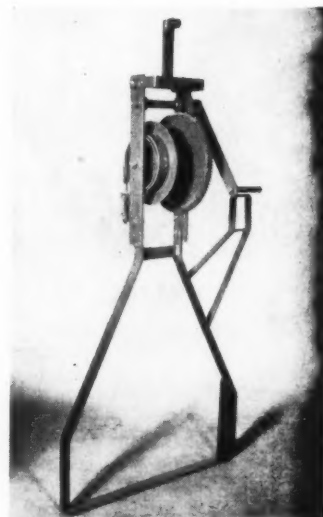
Feature after feature proves why these big new Chevies are the work champs of the heavyweight class! New triple-torque tandem axle option lifts G.V.W.'s to 32,000 lbs. . . . G.C.W.'s to 50,000 lbs.! New frame is 25 percent heavier to stand up to your *tough* jobs. Easy, safe hauling stems from modern Ball-Race steering with bigger, stronger steering assembly. Exclusive new Powermatic transmission saves work, reduces truck wear like nothing else. No other trucks give you *so much*.



## New Chevrolet Task-Force Trucks

Anything less is an old-fashioned truck!

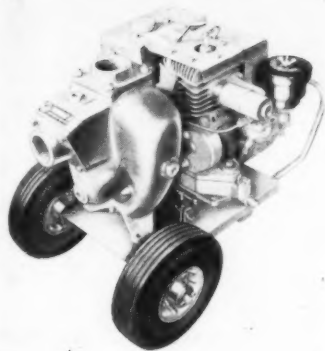
For more facts, use Reader-Reply Card opposite page 18 and circle No. 253



Several features of the new Waco swing stage are said to provide new safety guarantees.

CONTRACTORS AND ENGINEERS





### New centrifugal pump delivers 8,400 gph

■ A self-priming centrifugal pump which delivers 8,400 gph at a 10-foot lift is one of a new series of contractor's pumps announced by the Marine Products Co. Interior design features of this and the other Flomax pumps are said to provide maximum serviceability, longer pump life, and greater engine protection.

The Flomax 8 pump is powered by a Briggs & Stratton four-cycle engine with remote throttle control. Rated at 8,400 gph at a 25-foot total head, the pump uses a 2-inch pipe. In cast iron the unit weighs 74 pounds, but the pump is also available in bronze or aluminum construction.

According to the manufacturer, the unit's important design features include adaptor construction, standard crankshaft engine, exposed engine bearing, sleeve-type impeller, and a shaft seal on the impeller sleeve. Super-hard, greaseless mechanical seals, removable flanges, replaceable wear plates, and other features also are stressed.

Four other models, with capacities from 5,800 to 20,400 gph, are offered by the company.

For further information write to the Marine Products Co., 515 Lycaete, Detroit 14, Mich., or use the Request Card at page 18. Circle No. 145.

### Gasoline, diesel grader

■ The A-C Model D motor grader with either gasoline or diesel engine is featured in a catalog from Allis-Chalmers. Cutaway pictures illustrate the 8,800-pound 50-brake-hp gasoline model, and the 9,350-pound 50-brake-hp diesel model. Also pictured are the shiftable moldboard, power-circle turn, tubular frame, gearing, and front axle, as well as attachments and accessories. A brief description accompanies each picture. Complete specifications are given on both models.

To obtain this catalog write to Allis-Chalmers Mfg. Co., 864 S. 70th St., Milwaukee 1, Wis., or use the Request Card at page 18. Circle No. 86.

### Waukesha names Merriam assistant chief engineer

The new assistant chief engineer for the Waukesha Motor Co., Waukesha, Wis., is J. Roger Merriam.

With the company for 35 years, Mr. Merriam first served Waukesha as a tool designer. He has helped develop a number of design features used in most internal combustion engines.

For more facts, use coupon or circle No. 335→

### High-speed printer can handle 40 fpm

■ A 4,000-watt, high-speed, high-power whiteprinter for reproducing drawings, diagrams, and charts is announced by the Peck & Harvey Mfg. Corp. The Speedmaster Model 4000C utilizes the dry ammonia vapor process of true-to-scale diazo reproduction.

The new whiteprinter handles cut sheets or roll film at synchronized printing and developing speeds up to 40 feet per minute—a capacity of more than 100 square feet per minute. It can accommodate paper widths



The Speedmaster Model 4000C.

up to 44 inches. A Hi-Lo switch permits the reduction of the lamp wattage to 3,000 watts as necessary.

For further information write to Peck & Harvey Mfg. Corp., 5650 N. Western Ave., Chicago 45, Ill., or use the Request Card at page 18. Circle No. 49.

### Caterpillar plans opening of new Decatur plant

A new factory for the manufacture of wheel tractors and motor graders will be opened on May 21 by the Caterpillar Tractor Co. of Peoria, Ill. The new plant is situated in Decatur.

## Bucyrus-Erie Announces

# ALL-NEW DRAGLINE BUCKETS

NEW DESIGN!

NEW LIGHT WEIGHT!

NEW HIGH OUTPUT!



Three types available —  
light, medium, and heavy.  
Offered with either solid or  
perforated baskets.

A line of dragline buckets designed and built to set new high standards of performance — that's what Bucyrus-Erie now offers you. These new buckets include such high-production design features as:

1. "Slicing action" lip to penetrate material quickly and easily.
2. Tapered basket scientifically shaped to load full and fast.
3. Proper flaring and balance to minimize bobbing and spillage.

4. Smooth inside design and high arch for fast, clean dumping.

Along with outstanding design features, Bucyrus-Erie developed BECOLOY, a special steel alloy with a tough, fibrous structure that is especially suited to this type of service.

These new dragline buckets are built to introduce a new standard of performance — add new efficiency to your dragline operations. See your Bucyrus-Erie distributor soon for complete information — he is well qualified to help you select the right size and type for your job.



**BUCYRUS-ERIE COMPANY**

South Milwaukee, Wisconsin

### SEND FOR FREE BULLETIN!

Gentlemen: Please send me a copy of your new dragline bucket bulletin.

Name

Company

Address

City

State

## New line of radiophones for field communications

■ A new line of transistorized portable two-way radiophones, said to deliver up to 20 times the RF power output conventionally attained in such field communications equipment, has been announced by Motorola Communications & Electronics, Inc. Chiefly responsible for the increased power and receiver audio output are several recent advances in the development of transistors, plated circuitry, and lightweight, long-life power packs.

The complete line includes models with RF power output ratings from 1 to 8 watts. A full 8-watt transmitter power output is realized from a model weighing only 15½ pounds. The smallest weighs less than 8 pounds.



The three portable Handie-Talkie radiophones announced by Motorola are (left to right) the lightweight, maximum portability version with handset-type microphone; the speaker and microphone version; and the high-powered pack version.

One feature of the equipment is the "snap-on" power pack. Dry-cell, wet-cell, and 117-volt ac power packs are interchangeable. The wet-cell power pack employs rechargeable nickel-cadmium cells and includes the option

of operation from 6 to 12-volt vehicular-type batteries.

The line includes models in the 25 to 54-megacycle and 144 to 174-megacycle frequency range in both handset-type microphone and speaker-

palm-type microphone versions.

For further information write to Motorola Communications & Electronics, Inc., 4545 W. Augusta Blvd., Chicago, Ill., or use the Request Card at page 18. Circle No. 115.

## Quarry gun

■ The Remington Model 400 portable industrial gun for use in shattering rock overhangs in quarries is detailed in a catalog. Assembly, operation, mounts, firing techniques, and specifications are covered. A diagram of the unit points out each part of the gun.

To obtain this catalog write to Remington Arms Co., Inc., 939 Barnum Ave., Bridgeport 2, Conn., or use the Request Card at page 18. Circle No. 98.



## NEW Carbide Bonded\* Blades... ...cut costs 51%

It took Consolidated Diamond Tool to successfully put together DIAMONDS... the hardest, most durable natural stone, and CARBIDE... the toughest, most enduring of man-made metals. Result... the amazing Consolidated carbide-bonded, diamond, concrete saw blade.

Careful analysis of field reports and tests, conclusively show the new Consolidated blade lasts 2 to 3 times longer than conventional diamond blades. Longer blade life means lower costs... lower costs mean lower bids... lower bids mean more contracts.

In the last four months, 7 out of every 8 sawing contractors, for whom performance tests were conducted, adopted the new Consolidated blade immediately.

Write today for complete information and prices.



**Consolidated**  
**DIAMOND TOOL CORP.**  
320 Yonkers Avenue, Yonkers, N. Y.

\*Patents Pending.

\*\*Detailed New York International test available on request.

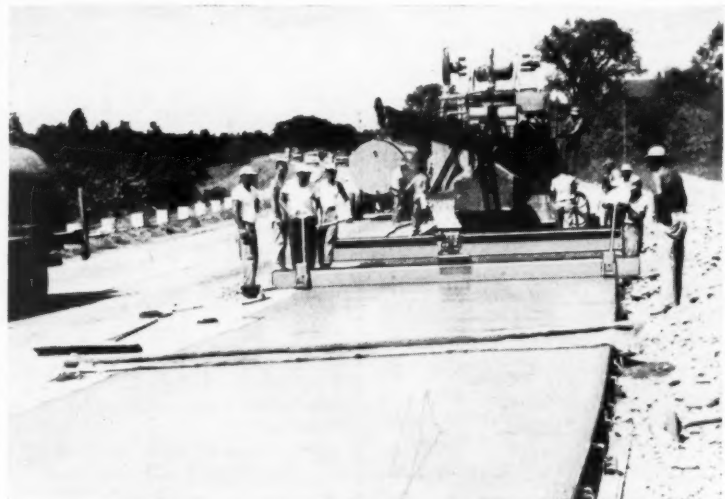
CONCRETE AND MASONRY CUTTING BLADE DIVISION

For more facts, use Reader-Reply Card opposite page 18 and circle No. 336

## 33-foot screed saves \$500 on 50,000 sq. ft. of concrete



Here's the story: The contractor on this warehouse job purchased the 33' STOW Screed to strike off a warehouse floor of 1" slump concrete. By using the 33' screed instead of the 12' screed he had been using, the contractor estimated that he saved \$500.00 on the 50,000 square feet poured. With a 1" slump concrete, the slab set up so fast that they were able to put a trowel on the job only 1 hour after screeding.



**Screeding a Third Lane on a Hill.** This job was too small for the contractor to put his big finishing machine on the job, so he used a 14' STOW Vibrating Screed. This screed can be bought as a packaged unit to be mounted on your own beam. For more information on screeds, write for STOW Catalog 560.

**STOW** **STOW MANUFACTURING CO.**  
40 Shear Street, Binghamton, N. Y.

For more facts, use Reader-Reply Card opposite page 18 and circle No. 337

CONTRACTORS AND ENGINEERS





The Koehring Model 305  $\frac{3}{4}$ -yard excavator has a lift crane capacity of 15 tons on a crawler mounting.

#### Add $\frac{3}{4}$ -cubic-yard model to new excavator line

■ Production of a  $\frac{3}{4}$ -cubic-yard excavator that is similar in basic design to the company's new  $\frac{1}{2}$  and 1-cubic-yard machines has been announced by the Koehring Co. The rig has been designated the Model 305.

The newest Koehring excavator has a rated lift-crane capacity of 25 tons on a truck chassis and 15 tons on a crawler mounting. It can be equipped with the full complement of attachments. The upper machinery has been simplified to contain only two major horizontal shafts. The all-welded turntable is equipped with integral sidestands, and main cross shafts revolve in antifriction bearings.

Other features of the Model 305 include self-cleaning crawlers, automatic traction brakes, a newly designed cab and operating lever arrangement, and a mechanical cam-type booster clutch on the main drum clutches.

For further information write to the Koehring Co., 3026 W. Concordia Ave., Milwaukee 16, Wis., or use the Request Card at page 18. Circle No. 43.

#### Concrete equipment line

■ Stow concrete vibrators, portable concrete grinders, vibrating screeds, and rotary trowels are described in a new catalog. Four different size Roto-Trowels of 24 to 46 inches in diameter are shown. Included are directions on how to build a vibrating screed beam. On-the-job operations, accessories, attachments, models, and parts are pictured. Complete specifications accompany each illustration.

To obtain Catalog No. 560 write to Stow Mfg. Co., 443 State St., Binghamton, N. Y., or use the Request Card at page 18. Circle No. 83.

#### American-Marietta buys Presstite Engineering

An agreement providing for the sale of all business and assets of the Presstite Engineering Co., St. Louis, Mo., to the American-Marietta Co., Chicago, Ill., has been approved by directors of both companies. Presstite will operate as an American-Marietta division and will continue to manufacture specialized sealing, insulating, and adhesive products.

Cyril H. Smith will be manager.



# ROCKFORD

## FIRST

Using a new type friction material of recent development, ROCKFORD was the **FIRST** to engineer these new materials into MORLIFE Clutches and Clutch Plates. They reduce clutch size and engaging pressure, operate longer without adjustment or plate replacement — and avoid down-time caused by burned or warped plates in heavy duty tractors, trucks, tanks, cranes, power units, shovels, bulldozers, earth movers and other heavy duty machines.

## MORLIFE\*

## CLUTCHES and CLUTCH PLATES



"MORLIFE clutch has gone 851 hours without slipping or adjustment."



"MORLIFE clutches last 950 hours longer, without adjustment."



"MORLIFE clutch needs adjustment once a month, instead of daily."



"MORLIFE requires lighter handle pull and one tenth the adjustments."



"MORLIFE clutch going strong after 1695 hours, working in sand."



"MORLIFE pulls harder and lasts six to ten times longer."

**400% MORE LIFE**

**100% MORE TORQUE**

**50% MORE HEAT RESISTANCE**

Before you approve specifications for your next models, it will pay you to investigate how MORLIFE Clutches will add to the service life of your product and reduce the number of stops for adjustments and repairs. It also will pay you to recheck specifications for your present models. For information covering operating characteristics, write Department E.

**ROCKFORD Clutch Division BORG-WARNER**

314 Catherine Street, Rockford, Illinois, U.S.A.

# CLUTCHES

For more facts, use Reader-Reply Card opposite page 18 and circle No. 254



Unclassified material, containing some small boulders, is loosened by an Ateco two-tooth ripper mounted behind a Caterpillar D8 before scrapers move into this area.

## Mild winter keeps work moving on highway grading project

by RAY DAY

Taking advantage of an unusually open winter in mile-high country in Arizona, the contractor for the last section of Arizona's Black Canyon Highway completed a 200,000-cubic-yard grading job—which included 60,000 cubic yards of rock that had to be drilled and shot—in three months' time. Only two days were lost on this project through January 16 because of rain. The crushing and screening plant was producing subbase material early in January, when the area around Prescott is usually covered with snow.

The 4.5-mile section is being built

for the Arizona State Highway Department by Isbell Construction Co.'s Arizona Division, which operates under the supervision of the firm's Reno, Nevada headquarters.

The \$401,303 contract for the Black Canyon Highway—a direct route from Phoenix north to Prescott—called for grading, production and installation of subbase, drainage structures, a 170-foot reinforced-concrete and structural steel bridge across Big Bug Creek, sealing, and installation of a single-penetration asphalt and rock-chip surface course. The completed roadway is 40 feet in width, and con-

sists of a 24-foot pavement with 8-foot shoulders on each side.

Completion of this contract closed the last remaining gap in the road, which has been under construction for several years. With other direct forks, now under construction into Verde Valley and Flagstaff to the North, the road eliminates the dangerous winding mountain grades through this steep country.

### Clearing crew starts

When Isbell Construction Co. received the job award, its main road-building crew was just finishing an-

other project east of Phoenix. One of the key foremen on this job was sent to the site with two Caterpillar D8 tractors, angledozers, and a small labor force to skin off a sparse desert growth of low shrubs and cactus and start the deep cuts needed on the right of way. The deepest cut came to 46 feet and the highest fill to 29 feet. Starting work at the south end of the job and moving uphill toward the north end, the clearing crew burned the desert brush as fast as the dozers piled it up, and had most cuts outlined by the time the roadbuilding crew moved in. Approximately 140,000 cubic yards

**BALANCE  
IN YOUR  
FAVOR!**

**WITH ROOSHORS**

You can increase your earning capacity per man-hour with the "one-man" ROOSHOR, extension type. This new ROOSHOR, extension type, actually gives you three shores in one . . . a flat-head shore, a male-head shore and an extension shore, by merely inserting any length 4 x 4 in the steel head. And, when bracing is needed, ROOSHORS make it easier with wooden upper members . . . no accessory clips needed.

*Since 1916—the leader of adjustable shores!*

**ROOS COLUMN CLAMPS**

. . . for greater speed and economy in column forming • two identical units • open either way • larger bars • no loose parts • only a hammer is needed • cannot be put on wrong.

Rooshors and Roos Column Clamps are available for rental with purchase option from warehouse stocks in principal cities. Write for Bulletin 556.

**MAIL  
THIS  
COUPON  
TODAY**

**BAKER-ROOS, INC.** C&E  
P. O. Box 892, Indianapolis 6, Indiana  
Gentlemen: Please rush additional information on Rooshors and Roos Column Clamps without obligation.

Name \_\_\_\_\_  
Company \_\_\_\_\_  
Address \_\_\_\_\_  
City \_\_\_\_\_ State \_\_\_\_\_

For more facts, use coupon or circle No. 255

## Birmingham HEAVY DUTY TRAILERS



Below: Model 1650-DLU (Fig. 164). Special Birmingham Trailer with extra low deck.

### "RUGGED WEAR OVER THE LONG HAUL"

Birmingham Trailers are built rugged for the big loads. There are standard designs and models for all kinds of hauling. Special models are built to order to your own

specifications. Standard models 10 to 100 tons capacity. Special models 40 to 265 tons capacity.

Write or wire for catalog and name of our Distributor in your territory.

### PARTS SERVICE

We carry a complete line of standard parts for all models of Birmingham Trailers. Our parts service is prompt and reliable.

**Birmingham** MANUFACTURING COMPANY, INC.

Main Office and Factory, Birmingham, Alabama, P. O. Box 1351 . . . Phone 53-5496  
New York Office, 30 Church St., N. Y. 7, Phone Digby 9-2893 • Cable Code Address: "BIRMCO"

For more facts, use Reader-Reply Card opposite page 18 and circle No. 256





A combination Pioneer screening and Cedarapids 18 x 36 crushing unit produces the 3-inch-minus subbase material being moved to the Pioneer surge hopper by conveyor. Raw pit material ranges from sand through small boulders.



Subbase material is dumped on the grade by a GMC truck. Blade mixing, sprinkling, and compaction with sheepfoot rollers will complete this phase of the work.

of the 200,000 yards of material being excavated consisted of unclassified matter that was easy to handle. This included clay, gravel, and small boulders, conglomerate, and soft shale. Some of these formations required ripping, but no shooting was necessary. One-way hauls for this material averaged 700 feet, and 1,800-foot hauls were the longest on the job. Some of the yardage to be removed lay over solid rock in seven cuts. Elsewhere, excavation brought the roadbed to final grade.

Grading was done by three single-power Euclid scrapers, two LeTour-

neau Model W Carryalls, and one LeTourneau Model FP Carryall, which were assisted by Caterpillar D8 prime movers and Caterpillar D8 pushers. A spare D8 did dozer work as the material was leveled on the fills.

Two types of rippers loosened some of this unclassified yardage: an Ateco two-tooth unit mounted behind one of the D8's, and a LeTourneau K-30 roter used behind a D8 prime mover. The K-30, ordinarily mounting steel wheels, had been converted to rubber-tire mounting in a Reno machine shop, and this improved the efficiency of the unit markedly, making it more

maneuverable and consequently easier to pull.

Unclassified dirt, laid down in lifts of less than 12 inches, was sprinkled and compacted with sheepfoot rollers immediately. One large Mack semitrailer, equipped to deliver 5,500 gallons of water by gravity, and two International 6 x 6 trucks, carrying 2,000-gallon tanks, supplied the water. The two sets of heavy Southwest sheepfoot rollers, ballasted to approximately 700-psi foot-pressure, worked closely with the grading fleet to compact the fills to high density as earthmoving progressed.

#### Tough rock excavation

The toughest part of the excavation was the removal of approximately 60,000 to 70,000 cubic yards of solid rock that included hard shale standing on end, granite, and even a few beds of onyx. The latter, occurring chiefly in a flat bed that lay in streaks through the parent rock, provided the crews with one of their main diversions: a never-ending search for the stone. For the most part, though, the onyx was just another kind of rock that had to be removed for the right-of-way.

Two principal types of drilling



## MEN OF STEEL



The East Vladnet extension to carry the roadway from the Holland Tunnel to the existing New Jersey Turnpike (Contract N-22) is being engineered and constructed by TERRY.

The story behind the brilliant construction achievements of the great TERRY organization is basically the story of men. Men of proven ability. Men of vast experience. Above all, dedicated men who have made it their business to master every facet of engineering, designing, fabricating and erecting. In every sense of the word, *men of steel*.

*work...not words...tells the story of*

# TERRY

Steel Contractors, Inc.

Sales & Executive Offices: THE TERRY BUILDING  
31 East 27th Street, New York 16, N. Y. • Murray Hill 9-0011

For more facts, use Reader-Reply Card opposite page 18 and circle No. 257

MAY, 1956

## BLUEJET CHAIN

PRECISION-BUILT  
FOR PEAK  
PERFORMANCE

**GUIDE LINK**—Reamed rivet holes give precision fit, eliminate stretch and "chain slop" for less wear, longer service.

**ROUTER**—Precision ground, chrome plated high grade steel means longer life, less sharpening.

**SIDE LINK**—Shaped for proper sprocket fit, ample "riding" area reduces bar wear, gives smoother cutting.

**RIVET**—Large head plus hardened bearing surface helps maintain chain tightness, assures longer life.



BlueJet chains fit all popular saws, and there's a chain for every purpose. Felling, bucking, limbing, pond saws—BlueJet does every chain saw job better. Ask for our precision engineered bars and sprockets, too.

BlueJet Chains, bars and sprockets are manufactured under a system of rigid quality control. They are job-engineered and field-tested to give superior results and longer wear—with all makes of chain saws, in all types of cutting. You need peak performance—trouble-free and fast—in your chain saw. You get it when you specify BlueJet Chains.

BlueJet Chain Co.  
2704 Fourth Avenue South  
Seattle 4, Washington  
Please send me literature on BlueJet Chains.

Name.....  
Address..... City.....  
BlueJet is the Universal Replacement Chain—a Precision Product for More Profitable Production

For more facts, use coupon or circle No. 258



Preparing the way for rock excavation, workmen put down blast holes on a 4 x 6 pattern with Ingersoll-Rand Jackhammers powered by an I-R 600-cfm Gyro-Flo compressor. About 60,000 yards of rock was excavated for the road.

equipment were employed on this excavation: wagon drills and jackhammers. Two well-used Caterpillar D8's were equipped with 315 and 500-cfm Gardner-Denver rotary compressors. The Gardner-Denver wagon drills, mounted on Gardner-Denver jibs, used Carnegie steel in lengths up to 20 feet and Timken rock bits to put down blast holes. These, on 12-foot staggered centers, were from 3 inches in diameter at the top to 2 3/4 inches at the bottom. An average of about 500 linear feet of drilling was done per shift by each drill. All the drill holes, excepting those on the side-slope rows, were sprung once and sometimes twice. From four to six sticks of Apache 40 per cent LF dynamite were used in the first springing, and a slightly larger charge, if feasible, was used on the second springing. Each hole was then loaded with from 250 to 300 pounds of Apache bag-type Amogel of 40 per cent strength.

The center of the cut was kicked out by Olin instantaneous electric blasting caps, while Olin No. 1 and No. 2 delays were used to break the cut slopes last. About 3/4 pound of powder was used per cubic yard of excavation.

Seven Ingersoll-Rand 55-pound Jackhammers were also on this job, powered by a 600-cfm and a 315-cfm Ingersoll-Rand Gyro-Flo compressor. Jackhammer steel, 12 feet long, made the hole pattern of 4 x 6 feet. After the bottoms of the holes were brought to a 2-inch diameter by Timken rock bits, the holes were column-loaded with bag powder. One of the newest Du Pont electric blasting machines, which is dependable for extensive shots, was used on this project. At one time, it shot a total of 640 holes, which were hooked in a series.

Broken rock was loaded out to Euclid end-dumps by a Northwest 80-D using an Esco 2 1/2-yard dipper with Esco teeth. The Euclids carried the material a maximum of 700 feet, depositing the rock in 3-foot layers, mostly at the bottom of fills.

Secondary drilling and shooting, when necessary for oversize rock, was done by a jackhammer crew working with one of the portable compressors.

The broken-rock fills were placed with the aid of water, which was used to sluice fine particles down into the voids. Work on rock cuts and unclassified excavation cuts was coordinated

so that the rock crew generally began working in an area that had just been cleared off by excavating equipment.


#### Subbase turned out fast

Working in two pit locations in Big Bug Wash, the firm's rock-crushing and screening equipment turned out a considerable amount of 3-inch-minus subbase material during the mild winter months. Both the locations which had been designated by the Arizona Highway Department remained dry throughout this time, due to a lack of rain. Both contain deposits of mountain stream alluvium, ranging from well-graded sand through boulders up to 15 inches in diameter.

The crushing plant had a trap leading into a variable-speed apron feeder,

a double-deck system of Pioneer Mesabi-type vibrating screens, a Cedarapids twin-jaw 18 x 36 jaw crusher, a Pioneer 30-inch stacker conveyor, and a Pioneer 35-cubic-yard surge bin. Even with a crushing ratio of 20 per cent, the plant turned out as much as 500 tons of subbase material hourly.

The Mesabi-type screens got rid of all acceptable material before it reached the crushing system of the plant. The Cedarapids twin jaw crusher took care of all oversize material without making production fall off in other parts of the plant. The crusher was directly driven by a Murphy diesel engine, while electric motors and other components were powered by a Caterpillar D318 diesel-electric generating set.



**NEW model HO**

**2 1/4 cu. yd. capacity**

**7,500 lbs. @ 4 m.p.h.**

**Gets MORE Keeps MORE Delivers MORE**



The surge hopper gates of the plant, opened and closed by air furnished by a Sterling-driven Worthington compressor, were operated by push-button controls from the plant operator's platform. Only the operator and his helper-oiler worked the plant, which supplied loads of the crushed material to three GMC 10-yard trucks and two Schonrock 18 to 26-ton cable-controlled trailers.

Raw feed was brought to the surge hopper by D8 and Allis-Chalmers HD-20 tractors with U-doers, which were assisted by an Allis-Chalmers HD-9 with front-end loader.

#### Base material laid

The GMC trucks and Schonrock trailers dumped the subbase material directly to the road, while an in-



Broken rock is hauled from cut to fill sections by Euclid end-dumps. Water sprayed on the fill from a tank truck works the fine particles down into the voids.

spector from the Arizona Highway Department supervised the operation. Lifts up to 9 inches thick were placed at one time, and two 6-inch lifts were put down in areas where a 12-inch thickness was required. After the material was blade-mixed by two Caterpillar No. 12 motor graders, it was watered by sprinkler trucks, then compacted by the two sets of sheepsfoot rollers. A self-propelled Tampo pneumatic machine completed the rolling work.

The granular subbase was topped by a leveling course of 1-inch-minus aggregate base, 3 inches thick, which was highly compacted as it was laid.

The MC-3 asphalt sealcoat and the single-course penetration of SC-6 asphalt with rock chips was done under a subcontract by Arizona Refining Co., Inc., Phoenix, a firm with a large enough volume of work to enable it to maintain a crew of specialists. This was routine work, the hot asphalt being hauled out from Phoenix and applied with an Etnyre pressure distributor, and the single-penetration treatment built with asphalt and chips.

#### Personnel

The project was designed and is being administered under the supervision of the Arizona State Highway Department, with William E. Willey as state highway engineer and C. B. Browning, deputy state engineer in charge of construction. Jim Foster is resident engineer, and Gene Maders, chief inspector.

Kenneth J. Rose managed the job for Isbell Construction Co., serving as general superintendent. He was assisted by Earl Stock, labor foreman, and Ralph Kriese, grade foreman.

THE END

## More Productive Capacity

It's the yardage a tractor-shovel delivers per hour or per shift that counts, and that is why the big new model HO "PAYLOADER" is outstanding. Pound for pound it's way ahead of the field in digging power, in maneuvering speed, in carrying capacity. It gets more load because of the pry-out and 40 degree tip-back bucket action — it keeps more (less spillage) while carrying because of the shock-absorber cushioning of the bucket — and it delivers more.

It operates easier, rides smoother — with or without a load — than anything near its size. It has balanced design and durability throughout to work for you day after day without interruption. If you want big productive capacity you want this big model HO.

### ROUGH Design . . . Quality . . . Value

**Digging power:** Pound for pound, this "PAYLOADER" has more traction and digging power — for a wider range of ground conditions — than any wheeled tractor-shovel ever built.

**Less slippage:** New, exclusive feature — torque-proportioning differentials — reduce slipping, give better traction. Up to 24% more torque is automatically transferred to the wheel with best traction.

**Hydraulic shock absorber:** A shock absorber in the hydraulic system smooths out the ride, permits faster load-carrying speeds over rough terrain — with less spillage.

**More production, less effort:** Power-steer, power brakes (on all 4 wheels), power shift (no "clutching") and good riding qualities also lessen operator fatigue — promote full production all day.

**Stay-clean hydraulic system:** The hydraulic system is closed and pressure-controlled to keep air and dirt out — reduces oil foaming, lessens trouble and prolongs life of all hydraulic system parts.

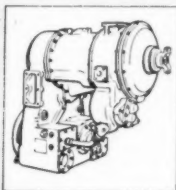
#### Long-life, high-traction drive train

Torque-proportioning differentials, an exclusive feature, assure effective traction under slipping conditions. If one wheel starts to slip, more power is delivered to the opposite wheel. Rugged planetary final drives in the wheel hubs, plus hypoid differential gearing, keep torque low in axles . . . prolong life of axles and all drive train parts.



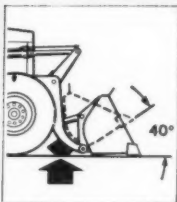
#### Complete Power-shift Transmission

The fastest and easiest-operating transmission you've ever seen. All shifts can be made instantly on-the-go, under full engine speed. There's no stopping for a RANGE shift, there's no foot clutch. With the forward-reverse control, the operator can "creep" the machine at full engine speed, in any gear, while maintaining full bucket action . . . all this, plus torque converter drive.



#### Tremendous pry-out action and 40° tip-back at ground level

Special pads are provided on the bottom of the boom arms to give ground support for powerful pry-out action. Load forces are also absorbed by the pads, relieving the axles and wheels of these strains. The bucket can tip back 40 degrees, before raising, to get heaped loads even in shallow cuts and low piles and to retain heaped loads.



#### THE FRANK G. HOUGH CO.

762 Sunnyside Ave., Libertyville, Ill.

Send full information on "PAYLOADER" 4-wheel-drive tractor-shovels.

☐ model HO-2 1/4 cu. yd. ☐ model HH-1 1/2 cu. yd. ☐ model HU-1 cu. yd.

Name \_\_\_\_\_

Title \_\_\_\_\_

Company \_\_\_\_\_

Street \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_

If you want the last word in tractor-shovel performance on your jobs, you'll want the big HO or a smaller 4-wheel-drive "PAYLOADER".



### Wood bridge substructures preserved in Alabama

Coating existing wooden structures with preservative to assure the stability of old pressure-creosoted timber bridges has, in three years, saved 47 per cent of the cost of building a new bridge. By applying creosote and a coat of Tie Sealing Compound, made by Koppers Co., Inc., Pittsburgh, Pa., the highway department expects the bridges to last for at least another 25 years.

Unsound timber was replaced with fresh pressure-creosoted pieces.

Isbell Construction Co. gets

## Better work for less money



Whether a construction job is easy, average, or difficult, there are always ways a contractor can make the current job smoother and more profitable. This at least is the contention of Isbell Construction Co., which re-

cently completed the last 4.5-mile stretch of Arizona's Black Canyon Highway. (See page 70.)

This job, done for the Arizona State Highway Department, involved grading, operating a rock plant to produce subbase and base material, and maintaining a field office in a relatively remote section of the state. The grading job alone involved some juggling of field forces, for of the 200,000 yards of excavation required, 60,000 yards was in rock that had to be drilled and blasted. Plenty of questions presented themselves to management during the course of the job, but Isbell found the answers that made it possible for crews to get work done quickly and profitably. Among the questions were:

*How can drilling costs be cut on this type of highway job?*

For Isbell, this question was answered satisfactorily by mounting a Gardner-Denver compressor, hydraulic jib, and wagon drill on old Caterpillar D8 tractors. The mobility gained by this type of mounting made it possible for each machine to put down about 200 additional feet of hole per shift on this job. Other advantages: the compressor moves when the rig does, and money is saved on air hose.

*How is it possible to keep cleanup costs from becoming excessive at final estimate time?*

A Caterpillar No. 12 motor grader provided the answer to this question. It was put to work shaving brush, rounding top slopes, and digging drainage ditches when cuts were being opened up. During this time, the motor grader is usually idle, so the cost of doing this work with the grader is at a minimum. Before the job was finished, a few laborers were sent through the site to hand rake slopes, burn brush, and touch up the area.

*How can truck drivers be prevented from killing time in the shop by stopping for minor unnecessary adjustments?*

Isbell almost had to consult Freud on this one, but it found the answer: one of the oldest, beat-up trucks was parked in the shop yard, and when a driver pulled in for some minor adjustment on his new truck, he was to take the old one and use it until his own truck was ready for use again. This put an end to time-killing.

*What can be done to reduce costs around a rock plant?*

There were two ways this was done. The first involved reducing the number of employees needed at the plant. One man less was needed at the surge bin after the company equipped it with slide gates and air rams, which

# Black & Decker® HEAVY-DUTY SAWS ARE POWER-BUILT to last!



**We don't buy motors—we build them!**

The heart of your electric tool is the motor—completely built by Black & Decker. All the power you need and then some . . . because each motor is built for a specific tool and the job it must do. B&D motors always stand up!

## NEW 6½" Saw races through 2x4's... even at a 45° angle

Black & Decker offers the complete heavy-duty saw line—with enough power and versatility for every professional need. This new B&D 6½" Heavy-Duty Saw (shown above) makes all cuts in 2x10 and smaller lumber, even at a 45° angle with blade to spare! And all B&D Saws—6", 6½", 7", 8" and 9" models—handle practically any building material: ferrous and non-ferrous metals, corrugated sheets, ceramics, tile, slate, Transite.

Latest safety features, latest convenience features—telescoping guard, larger lift-lever, instant-release trigger switch; calibrated quadrant, larger wing nuts, for faster, easier depth and bevel adjustments . . . clear-view operation . . . easier cutting from right or left side! Every B&D Saw is Power-Built for years of satisfactory, efficient service! See your B&D distributor or write: THE BLACK & DECKER MFG. Co., Dept. 7905, Towson 4, Md.

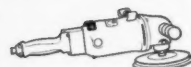
**SERVICE** . . . one of 42 Black & Decker factory service branches is located "next door" to you. Staffed by experts to give you fast, efficient service, genuine replacement parts.



LOOK IN THE YELLOW PAGES UNDER "TOOLS-ELECTRIC"

**Black & Decker®**  
PORTABLE ELECTRIC TOOLS

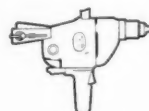
For more facts, use Reader-Reply Card opposite page 18 and circle No. 260



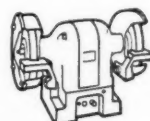
SANDERS



HAMMERS



DRILLS



BENCH GRINDERS

CONTRACTORS AND ENGINEERS



During the early grading stages, a Caterpillar 2 motor grader trims the slope and cuts drain-ditches. This costs little, for the grader is usually during this phase of a project.



Standardization helps keep lubrication costs low on this project. At this central location is the skid-mounted fuel system, consisting of a 1,000-gallon gasoline tank and 10,000-gallon Texaco diesel fuel storage tank.

were operated by a small Worthington compressor driven by a Sterling motor. The compressor also made it possible for the plant operator to sound a horn telling trucks to move ahead, and it furnished air for blowing equipment free of dust after a day's run.

The firm also cut costs at the plant by loading conveyor belts in such a way that their life was extended. Double-deck Pioneer Mesabi-type vibrating screens passed fine material to the belt first, providing a cushion for the intermediate rounded rock which was loaded from a lower vibrating deck. Sharp, jagged pieces dropping out of the jaw crusher fell on the layer of rounded rock so that the belt was not subject to a great deal of wear and tear.

#### How can field office costs be cut?

The most effective method used to achieve lower costs here was relatively simple. All unnecessary or overlapping work was eliminated. Only one man was responsible for preparing the payroll, writing checks, paying bills, making purchase orders, and handling routine office tasks.

#### What can be done to keep lubrication costs low, while making sure machines will be serviced properly?

Standardization of lubricants provided an answer to this question. Isbell used Texaco products, including HD90 gear lube, Aleph oil, Marfak No. O and No. 1 grease, Ursa SAE 30 heavy-duty engine oil, Regal oil B, and Marfak track roll lubricant. Texaco diesel fuel was hauled by 10,000-gallon transports from Long Beach, Calif., 450 miles away. And since automotive-type fuel was used in all diesel engines, separate handling and storage facilities were not needed.

THE END

### Professional lookers-on are granted recognition

As a vote of confidence in a standing American tradition, the Los Angeles, Calif., Chamber of Commerce has bestowed official recognition on sidewalk superintendents throughout the country. Provided the members fulfill the conditions—making minor suggestions, visiting construction sites regularly, and making suggestions about neighboring property—they may be received as accredited card-carrying official sidewalk superintendents.

Privileges of members do not extend to interior decoration or landscaping. Members are not permitted to accept fees for their advice.

## Travels 24 mph cross-country with 20 cubic yard payload TIMKEN® bearings keep it rolling

THIS is International Harvester's Model 75 Payscraper. It can travel cross-country at 24 MPH with a 20 cubic yard payload. One of the ways International Harvester assures long life in spite of the most difficult jobs is by mounting vital parts on Timken® tapered roller bearings.

In the tractor's differential and on its pinion shaft and engine shaft, Timken bearings insure accurate gear meshing. That's because the tapered design of Timken bearings lets them take radial and thrust loads in any combination. Shaft alignment

is insured. There's always a smooth flow of power.

Full line contact between rollers and races of Timken bearings provides the extra load-carrying capacity they need to handle extra-heavy loads. And because Timken bearings keep housings and shafts concentric, they make closures more effective. Lubricant stays in—dirt stays out.

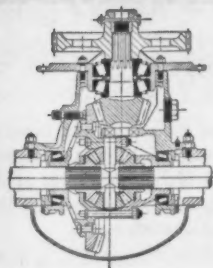
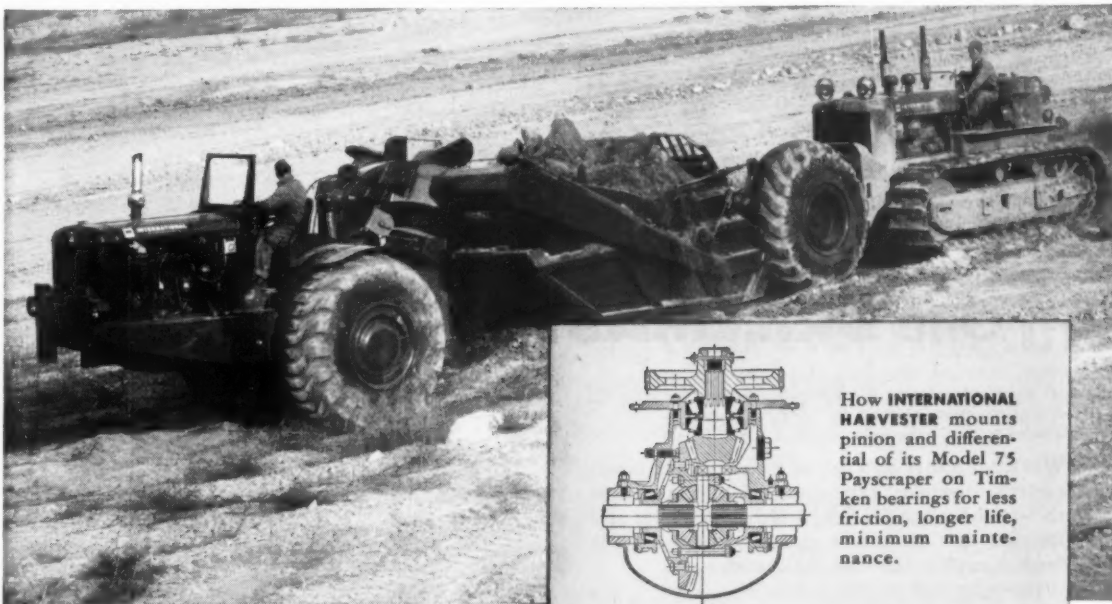
Timken bearings also keep maintenance low. One reason: they're designed by geometrical law to have true rolling motion and made with extreme accuracy to provide the low

friction this design makes possible. To insure the highest quality steel, we make our own. We're America's only bearing maker that does.

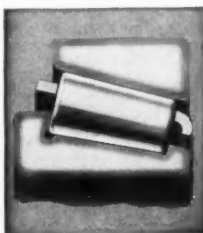
Make sure the equipment you buy or build has Timken bearings. Look for the trade-mark "Timken" on every bearing. The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO".



This symbol on a product means its bearings are the best.



How INTERNATIONAL HARVESTER mounts pinion and differential of its Model 75 Payscraper on Timken bearings for less friction, longer life, minimum maintenance.



#### GREATER LOAD AREA

Because the load is carried on the line of contact between rollers and races, Timken bearings carry greater loads, hold shafts in line, wear longer. Only Timken tapered roller bearings have these advantages: 1. advanced design; 2. precision manufacture; 3. rigid quality control; 4. Timken fine alloy steels.

**TIMKEN**  
TRADE-MARK REG. U. S. PAT. OFF.  
**TAPERED ROLLER BEARINGS**



NOT JUST A BALL — NOT JUST A ROLLER — THE TIMKEN TAPERED ROLLER BEARING TAKES RADIAL AND THRUST — LOADS OR ANY COMBINATION

For more facts, use Reader-Reply Card opposite page 18 and circle No. 261

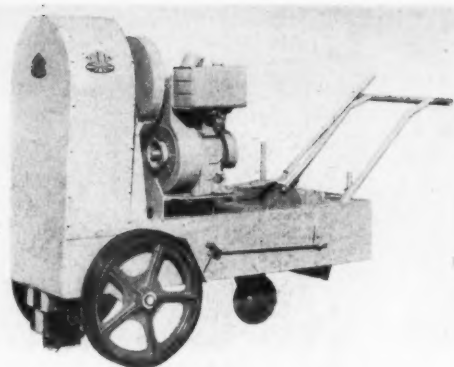
### Cable-driven breaker alternates as tamper

■ A new, non-pneumatic concrete breaker equipped with interchangeable asphalt-cutting and backfill-tamping heads is announced by the Cutcrete Mfg. Co.

The Model 1000 is mounted on a heavy-duty self-propelled truck carriage with pneumatic wheels, and is operator-ridden. The breaker-head carriage pivots and is hydraulically positioned. The 1,000-pound breaker head operates at 60 strokes per minute and can break 10-inch-thick concrete at rates up to 20 feet per minute.

The lighter Model 200 is pushed along by means of a bar handle that can be removed for compact storing

Cutcrete's Dynamic concrete breaker, shown here in the lighter Model 200, features interchangeable asphalt-cutting and backfill-tamping heads.



or shipping. It also operates at a maximum of 60 strokes per minute and works on concrete 5 inches thick at rates up to 20 feet per minute.

The manufacturer recommends the

breaker for pipe and conduit trenches, utility repairs, asphalt cutting, and backfill tamping, in addition to general concrete-breaking.

For further information write to

the Cutcrete Mfg. Co., 543 S. Tyler Ave., El Monte, Calif., or use the Request Card at page 18. Circle No. 117

### Great strength claimed for nylon-plastic fabric

■ A plastic-coated nylon fabric, said to resist tearing regardless of the amount of tension exerted, is obtainable from Herculite Protective Fabrics, Inc. The manufacturer claims it is ten times stronger than canvas and recommends its use for protecting work areas and equipment from the elements.

The fabric, called Herculite, is also reported to be completely waterproof, impervious to acids, grease, oil and the corrosive effects of salt water, and easier and quicker to handle because of its light weight. It will not support combustion.

Available in a wide range of colors, Herculite can be converted to any size or shape. Grommets, ropes, or special fittings can be supplied to meet special requirements.

For further information write to Herculite Protective Fabrics, Inc., 140 Little St., Belleville, N. J., or use the Request Card at page 18. Circle No. 30.

### Portable batch plants

■ Blaw-Knox portable bulk cement plants and portable aggregate plants are featured in a 41-page catalog from the company. According to the catalog, the plants have storage capacities of from 200 to 2,500 barrels. Models shown include bulk cement plants, twin cement batchers, weighing batchers, cement elevators, aggregate bins, twin aggregate batchers, water-weighing tanks, combined aggregate and cement bins, batchers with beam scales, one-stop plants, and bolt-erected plants. Dimensional diagrams, job photos, and specifications are given.

To obtain Bulletin No. 2488 write to Blaw-Knox Co., Construction Equipment Division, Mattoon, Ill., or use the Request Card at page 18. Circle No. 54.

### Engine-driven welders

■ Six models of the Shield-Arc industrial dc welders are featured in a catalog from the manufacturer, The Lincoln Electric Co. One diesel engine-driven welder is shown; the other five models pictured have gasoline engines. Outstanding features and complete specifications are given on each model.

To obtain this catalog write to the Lincoln Electric Co., 22801 St. Clair Ave., Cleveland 17, Ohio, or use the Request Card at page 18. Circle No. 94.

### Dravo Corp. appoints

Harmon C. Richardson has been appointed assistant manager of the shaft and tunnel department of the contracting division of Dravo Corp., Pittsburgh, Pa. A former project superintendent, he has been with Dravo since 1929.



## One DRILLMASTER keeps three shovels busy!

WORKING NIGHT AND DAY in a big rock cut on an eastern turnpike extension, the DRILLMASTER shown above was sinking 6-inch blast holes and keeping one 3 1/2-yard and two 3-yard shovels busy handling the rock produced.

By means of DRILLMASTER's "down the hole" Depth-Master drill, holes 55 feet deep were drilled on 14-foot centers with 19-foot burden. Average overall footage ran 25 feet an hour, and production topped 5900 gross cubic yards in 24 hours. The DRILLMASTER Carset Jackbits delivered an estimated total life of 10,000 feet of hole, with over 800 feet between sharpenings.

An exclusive DRILLMASTER feature, the unique "down the hole" Depth-Master drill goes down with the bit. It avoids the waste of power normally required to overcome the inertia of long lengths of drill steel.

The three-way DRILLMASTER can also be used as a Rotary drill or with the Power-Master combination "out of the hole" drill. Complete packages—including tower and accessories—are available for tractor or truck mounting.

Write for Bulletin 4179.

5-388



## Ingersoll-Rand

11 Broadway, New York 4, N.Y.

ROCK DRILLS • COMPRESSORS • AIR TOOLS • TURBO BLOWERS • CONDENSERS • PUMPS • OIL & GAS ENGINES

For more facts, use Reader-Reply Card opposite page 18 and circle No. 262





Protected by an Olin polyethylene sheet which covers the entire exterior of this unfinished building, workman can continue operations in heavy spring rainstorms.

### New plastic covering for all tarpaulin uses

■ A polyethylene plastic covering is now available from the Olin Mathieson Chemical Corp. for use in protecting workers, materials, and equipment from adverse weather conditions and in curing concrete. The sheeting is being manufactured in 2, 4, and 6-mil gages in widths up to 16½ feet.

Some of the advantages claimed for the plastic covering are that it acts as a draft and dust barrier and provides moisture and vapor protection, is not affected by temperatures between 160 and minus 70 degrees F, is flexible and conforms easily to most desired shapes, and will not break, tear, puncture, or deteriorate under ordinary usage once it is in place. It also will not rot or mildew, according to the manufacturer.

The company also recommends this polyethylene covering for use under floors and around foundation walls.

For further information write to the Olin Mathieson Chemical Corp., 460 Park Ave., New York 22, N. Y., or use the Request Card at page 18. Circle No. 42.

### Hydraulic systems

■ Hydraulic systems for mobile equipment are detailed in a catalog from Vickers, Inc. Various models diagrammed or pictured include pumps and controls, power steering, and balanced vane-type motors. Outstanding features and specifications are included.

To obtain Catalog No. M-5101 write to Vickers, Inc., 1400 Oakman Blvd., Detroit 32, Mich., or use the Request Card at page 18. Circle No. 68.

### Material handling

■ Auxiliary equipment for handling bulk material such as rock and gravel is described in a bulletin from the McNally Pittsburgh Mfg. Co. Pictured or diagrammed are dumpers, retarders, conveyors, feeders, hoppers, drives, elevators, journal boxes, and conveyor chains. Data tables and specifications are included.

To obtain Bulletin 955 write to McNally Pittsburgh Mfg. Co., Pittsburgh, Kans., or use the Request Card at page 18. Circle No. 57.

### Warning light flashes 2,100 hours on dry cell

■ A flashing mechanism said to be capable of 2,100 hours of continuous operation on one dry cell battery is manufactured by the Pioneer Signalite Co. The manufacturer recommends the unit for construction and road-building jobs.

The flasher is reported to be dust and explosion proof and is completely self-contained. The large square lens, either red or amber in color, has 360-degree visibility and contains approximately 85 square inches of light surface.

The device, equipped with a special on-off switch controlled only by the owner, is foolproof to vandals, according to the manufacturer. The light is

easily attached to any kind of barricade with theftproof bolts. It is reported to operate dependably even in adverse weather.

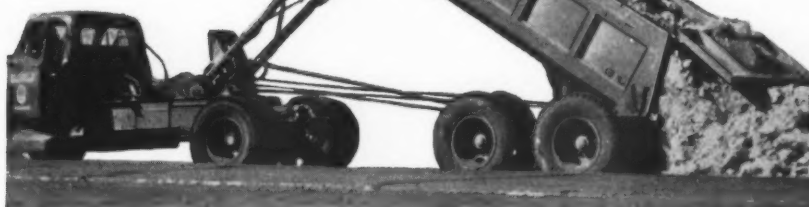
For further information write to the Pioneer Signalite Co., 11300 Hindry Ave., Los Angeles, Calif., or use the Request Card at page 18. Circle No. 71.

### U. S. Lift Slab elects new vice president

David T. Beals, III, has been elected a vice president and a member of the board of directors of the United States Lift Slab Corp., Austin, Texas. He will be in charge of the Kansas City office which the firm will open shortly. Beals will also serve as a director of the company's foreign subsidiary, International Lift Slab Corp.



Operators all over the U.S. and in several foreign countries are increasing profits with HOBBS Schonrock Cable Dump TRAILERS.



**CHECK THESE PROFIT-MAKING FEATURES OF**

**HOBBS Schonrock Cable Dump TRAILERS**

#### ☐ BIGGER PAYLOADS

Your truck hauls three to four times as much as when used with an ordinary truck dump body. Variable kingpin locations permit rigging up for full payload advantage of your state bridge formula laws.

#### ☐ EQUIPMENT WEIGHT REDUCED

You gain more payload because cable dump method does away with heavy hydraulic lift and conventional trailer center frame.

#### ☐ ADAPTABLE TO VARIED USES

Batch gates may be installed to enable you to dump partial loads at specified distances. Can be easily adapted for use with paving finishers.

#### ☐ LOWER MAINTENANCE COST

Lower maintenance costs mean increased profits. Booster fifth wheel automatically reduces strain on cable and equipment at start of dumping cycle. Simple block and tackle lifting principle eliminates heavy, expensive, intricate mechanisms.

#### ☐ EASY TO HANDLE

Automatic tail gate permits one man to handle complete operation easily and quickly. Maneuvers easily and safely when on the road or while in dumping position.

#### ☐ TRUCK IN USE FULL TIME

Your truck is in use full time. Fifth wheel adapter plate allows quick switch to other types of trailers.

**HOBBS TRAILERS DEPT. CG**  
609 NORTH MAIN, FORT WORTH, TEXAS  
Please send details about HOBBS Schonrock Cable Dump TRAILERS.

NAME \_\_\_\_\_  
FIRM \_\_\_\_\_  
ADDRESS \_\_\_\_\_  
CITY \_\_\_\_\_

Let us tell you more. MAIL THE COUPON.

**HOBBS TRAILERS**

609 NORTH MAIN

FORT WORTH, TEXAS

SALES AND SERVICE IN 38 STATES AND MAJOR CITIES  
DISTRIBUTORSHIPS AVAILABLE IN SOME AREAS

For more facts, use coupon, or Reader-Reply Card opposite page 18 and circle No. 263

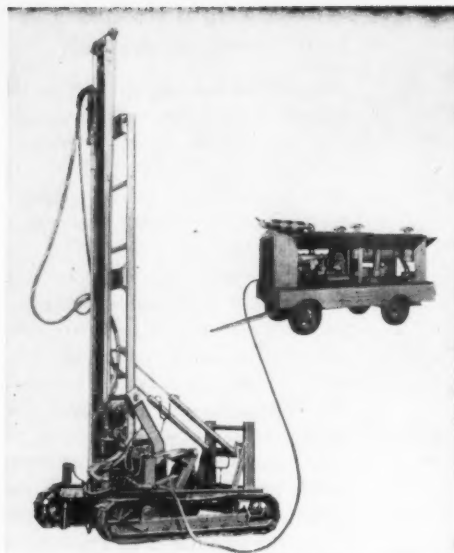
## Heavy-duty compressor, drill are announced

■ Two pieces of heavy-duty equipment for construction and rock quarry operation, a 900-cfm portable compressor and a 5½-inch percussion rock drill, have been announced by the Gardner-Denver Co.

The new Rotary 900 is similar in design to the manufacturer's Rotary 600 unit. It is a two-stage compressor with normal operating pressure of 100 psi.

The Model DH143 rock drill has a 5½-inch hammer diameter and offers the user a selection of bit sizes from 3½ to 5 inches. A special line of carburized sectional drill rods, couplings, and shanks is also available.

The drill is furnished with an



Gardner-Denver's DH143 5½-inch rock drill and Rotary 900 compressor.

air-powered self-propelled crawler mounting. The chain-feed drilling mast accommodates 20-foot rod changes, and can be hydraulically adjusted to drill toe holes at 15 degrees below the horizontal. The unit will drill horizontal face holes as high as 8 feet above the floor. When set to drill at 10 degrees above the horizontal, the bit enters the face at a height of 10 feet. The drill and mast may also be mounted on a heavy-duty diesel tractor.

For further information write to the Gardner-Denver Co., S. Front St., Quincy, Ill., or use the Request Card at page 18. Circle No. 9.

## Disposable container dispenses salt tablets

■ The E. D. Bullard Co. has developed a new disposable dispenser for salt tablets. The cylindrical container is especially designed to hold 1,000 orange-impregnated, non-nauseating tablets that quickly eject one at a time when the chemical-resistant knob at the bottom of the container is turned.

The formula used for Bullard salt tablets reduces the quantity of tablets needed per man to replace body salt lost through excessive perspiration, according to the company.

To establish accessible and easy-to-see salt tablet dispensing stations, a brightly-colored, 9½ x 7-inch cardboard poster backboard is furnished with each dispenser, along with metal wall grips.

For further information write to the E. D. Bullard Co., 275 Eighth St., San Francisco, Calif., or use the Request Card at page 18. Circle No. 118.

## Book on timber piles

■ "Pressure Treated Timber Foundation Piles," a new book of engineering information, has been published by the American Wood Preservers Institute. Comprehensive and well illustrated, it is available to architects, engineers, and builders interested in foundations for heavy buildings, bridges, seawalls, viaducts, overpasses, and other large structures. Filled with documented case histories, the work includes pile-driving formulas, means for determining safe loads, methods of solving problems of uplift and lateral forces, and information on protective devices for use during driving.

To obtain this catalog write to the American Wood Preservers Institute, 111 W. Washington St., Chicago 2, Ill., or use the Request Card at page 18. Circle No. 13.

## Tunnel forms

■ All-steel tunnel forms for subways, sewers, and tunnels are shown in a bulletin from the manufacturer, Mayo Tunnel & Mine Equipment. Automatic couplers for mine cars hauling men and materials, and skips and cages for mine shafts are pictured.

To obtain Bulletin No. 22 write to Mayo Tunnel & Mine Equipment, P. O. Box 1437, Lancaster, Pa., or use the Request Card at page 18. Circle No. 85.

# ADD PUSH... SUBTRACT FUEL!

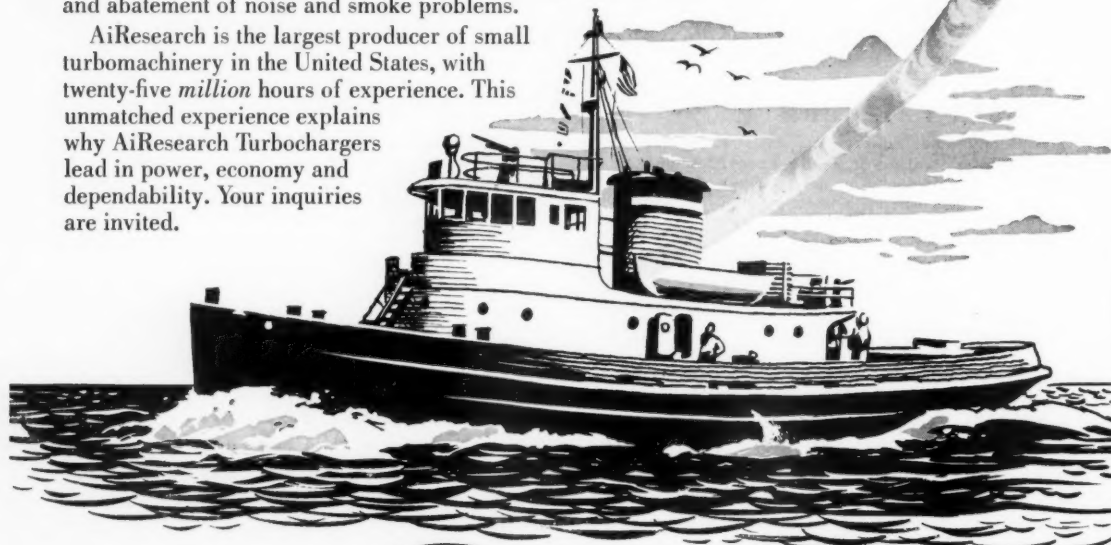
**AiResearch Turbochargers give your diesel far greater power while actually decreasing fuel consumption, noise and smoke!**

In mobile diesel engines, where size, weight and fuel capacity must be limited, AiResearch Turbochargers add more power per inch, pound or gallon of fuel than any comparable installation.

An example is the remarkable success achieved in the recent application of these power packages to Caterpillar diesel machinery.

Equally impressive power increases can be achieved in the application of AiResearch Turbochargers to stationary diesel equipment. Here, the outstanding benefits added to the output boost will be lower operating costs and abatement of noise and smoke problems.

AiResearch is the largest producer of small turbomachinery in the United States, with twenty-five million hours of experience. This unmatched experience explains why AiResearch Turbochargers lead in power, economy and dependability. Your inquiries are invited.



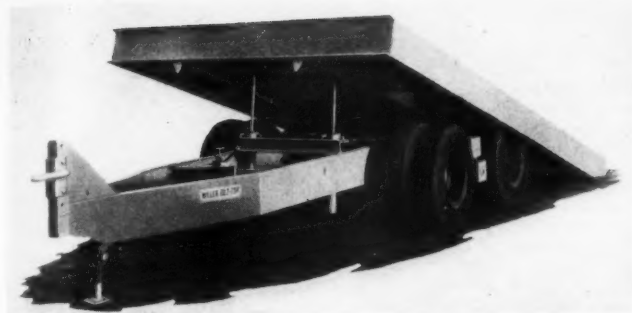
**THE GARRETT CORPORATION**  
AiResearch Industrial Division

9225 Aviation Blvd., Los Angeles 45, California

DESIGNERS AND MANUFACTURERS OF TURBOCHARGERS AND RELATED MACHINERY

For more facts, use Reader-Reply Card opposite page 18 and circle No. 264





### Tilting-platform trailer features 13-ton capacity

■ A heavy-duty, tandem-axle, tilting-platform trailer with a 13-ton capacity, for hauling construction and roadbuilding equipment, has been announced by the Miller Tilt-Top Trailer Co. The Tilt-Top Model OT-13 includes as standard equipment the platform and eight 7.50 x 15, 12-ply tires. A twin-hydraulic tilt control, electric brakes, lights, and safety chains are optional.

The new model, the manufacturer reports, is designed to allow faster loading, unloading, and hauling of such equipment as shovels, trenchers, finishers, backhoes, and tractors up to 26,000 pounds gross weight. Ease of maneuverability in backing and turning is emphasized.

Miller engineers claim great structural strength is achieved both by massive construction and an arrangement in design whereby the heavy tongue extends back to the rear set of wheels, giving double frame strength under the area of greatest load concentration.

An over-all platform height of 33 inches has been obtained by placing the pivot point of the platform toward the rear of the axle assembly. The platform measures 8 x 16 1/2 feet and is decked with 2-inch oak. Another feature is a tandem-axle walking beam mounted on Timken roller bearings.

For further information write to the Miller Tilt-Top Trailer Co., 428 S. 92nd St., Milwaukee 14, Wis., or use the Request Card at page 18. Circle No. 119.

### Erosion problems

■ A solution to erosion problems resulting from the action of air and water upon raw surfaces of earth and soft-rock slopes is the subject of a bulletin from Gunite Contractors Association. The booklet illustrates typical control jobs and details suggested procedures for the work.

To obtain Bulletin 125 write to Gunite Contractors Association, 714 W. Olympic Blvd., Los Angeles 15, Calif., or use the Request Card at page 18. Circle No. 99.

### New Worthington post filled by C. R. Stempf

The newly formed standard products section of the export department of Worthington Corp., Harrison, N. J., is being managed by C. R. Stempf. Previously, he was the corporation's special representative in Madrid, Spain.

For more facts, circle No. 329→

For greater strength, the tongue on the new Miller Model OT-13 Tilt-Top trailer extends back to the rear set of wheels.

### New line of durable, compact barricades

■ All-steel barricades in a complete range of styles and sizes are offered by the Traffic Equipment Corp. The new line of Sentry barricades is offered with accessory sign and light brackets, extensions, and flags.

Panels are made of formed 16-gage steel, zinc-coated, bonderized, and reinforced at both ends. The finish is baked enamel. Scotchlite markings are optional.

The stands are constructed of hot rolled steel sections, arc-welded and reinforced for strength. The advantages claimed are durability, compactness, portability, and ease of assembly.

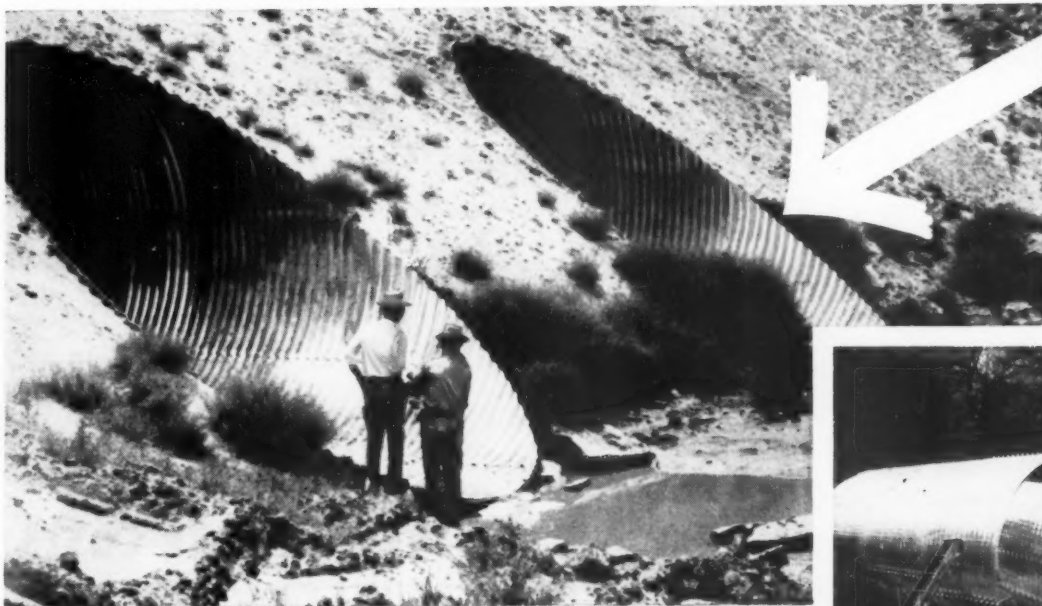


The all-steel barricade for heavy highway-construction projects available from Traffic Equipment Corp.

For further information write to the Traffic Equipment Corp., 2461 S. Dahlia Lane, Denver 22, Colo., or use the Request Card at page 18. Circle No. 20.

## NOW AVAILABLE

# AMBRIDGE Sectional Plate for any shape or size of pipe, arch, or pipe-arch



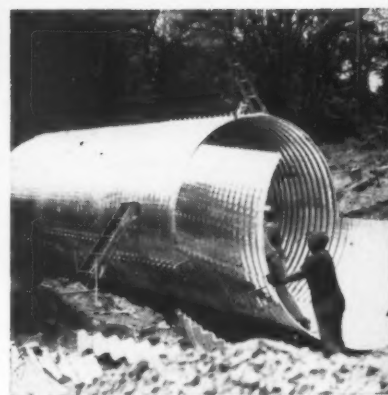
## to save you time and money in building low-cost drainage structures

AMBRIDGE Sectional Plate for Pipes, Arches and Pipe-arches is fabricated to meet the specifications of the American Association of State Highway Officials and can be adapted to all state, railroad and government specifications.

The plate is fabricated with 2" deep corrugations on 6" centers with standard punching, and *galvanized after fabrication*.

AMBRIDGE Sectional Plate is furnished to accommodate any shape or size of pipe, arch, or pipe-arch, complete with bolts. Special details, such as asphalt coating, hook bolts, beveled ends, and skewed ends, are furnished as specified for each job.

For further information, we suggest that you contact the office nearest you. Or, an inquiry direct to our Pittsburgh headquarters will bring detailed information.



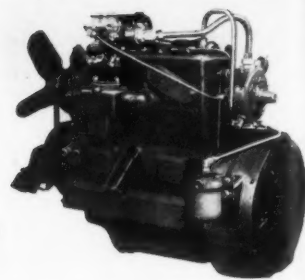
AMERICAN BRIDGE DIVISION, UNITED STATES STEEL CORPORATION • GENERAL OFFICES: 525 WILLIAM PENN PLACE, PITTSBURGH, PA.  
Contracting Offices in: AMBRIDGE • ATLANTA • BALTIMORE • BIRMINGHAM • BOSTON • CHICAGO • CINCINNATI • CLEVELAND • DALLAS • DENVER • DETROIT • ELMIRA • GARY  
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UNITED STATES STEEL EXPORT COMPANY, NEW YORK

# AMBRIDGE Sectional PLATE USS

UNITED STATES STEEL



A WIRE ROPE FITTING, originally designed for protecting slings and wire rope when hoisting objects with sharp corners, has been put to other uses. Here the Newco sling saddle is used in hoisting a fabricated structural member on a building job. Utilizing a choker sling and the sling saddle, the ingenious erection superintendent on this job brought a greater measure of safety to this hoisting job. For further information write to the **Newco Mfg. Co.**, 3636 Main Street, Kansas City 11, Mo., or use the Request Card at page 18. Circle No. 142.



Willys' Motors' Jeep engine adapted for use with higher octane propane and clean burning natural gas.

### Modify industrial engines to use lpg, natural gas

■ Liquid petroleum gas and natural gas conversions of Jeep L-head and F-head industrial engines manufactured by Willys Motors are now available as optional equipment. The company maintains that the use of hard-faced stellite valve inserts, standard Willys water cooling of the manifold, and lpg carburetor and regulator equipment make the Jeep engine ideal for burning propane or natural gas.

The advantages of the lpg or natural gas conversions, according to the manufacturer, lie in their high octane (over 100) at low cost. Since liquid petroleum gas is a by-product in the manufacture of gasoline, it is available in virtually unlimited quantities; yet at present, only a small portion of lpg is being put to commercial use, the company reports.

Other advantages of utilizing lpg for industrial engine power are said to include the prolonged use of lubricating oil without danger of thinning, the substantial reduction of carbon deposits, the less frequent need for maintenance, and the longer life of the engine due to the fact that lubrication of moving parts from the crankcase reaches a high degree of efficiency.

For further information write to Willys Motors, Inc., Industrial Engine Dept., 1515 N. Cove Blvd., Toledo, Ohio, or use the Request Card at page 18. Circle No. 108.

### Reinforcing bars

■ Bethlehem Steel's reinforcing-bar accessories for beams and slabs on highways, streets, foundations, and other installations are pictured in a folder from the company. Parts shown are slab and beam bolsters, high chairs, bar and joist chairs, and continuous high chairs. Installations are diagrammed and specifications are given.

To obtain Folder 550-A write to Bethlehem Steel Co., Bethlehem, Pa., or use the Request Card at page 18. Circle No. 53.

### N. J. pike section opens

The initial section of the Newark Bay-Hudson County extension of the New Jersey Turnpike was opened early in April. The section runs from Newark Airport to Bayonne, and includes the new bridge crossing of Newark Bay. The remainder of the extension will open this summer.

CONTRACTORS AND ENGINEERS

## Firestone NYLON TIRES



### CUT DOWNTIME LOSSES AND REDUCE TIRE COSTS ON LARGE OR SMALL HIGHWAY CONSTRUCTION JOBS

**T**ODAY's fast highway construction timetables call for rugged, efficient earth moving equipment that is capable of top performance in all types of soil conditions.

Earth moving units, like the one illustrated above, will maintain better schedules and cost less to operate if they roll on Firestone Nylon Tires.

Firestone Nylon Tires are built for the toughest service. The treads give maximum traction and they

are extra tough to resist cutting. Double-thick sidewalls give added protection against cuts and snags.

Firestone's Safety-Tensioned Gum-Dipped nylon cord body gives greatest protection against impact breaks . . . flex breaks . . . heat failures . . . and water damage.

Let your Firestone Dealer or Store show you how Firestone Nylon Tires will cut downtime and increase the profits on any job.



A TIRE FOR EVERY ROAD, LOAD AND CONDITION OF SERVICE

GROUND GRIP GG WIDE BASE ROCK GRIP RG WIDE BASE ALL NON-SKID ALL TRACTION RIB EXCAVATOR

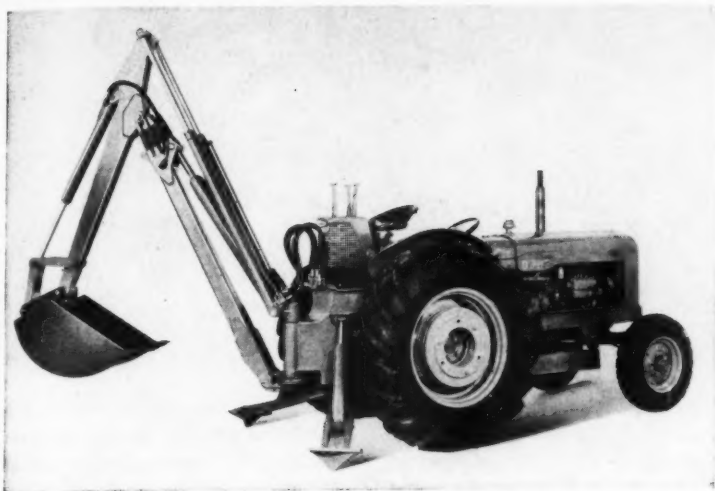
WHEN YOU BUY NEW EQUIPMENT OR REPLACEMENT TIRES, SPECIFY FIRESTONE

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For more facts, use Reader-Reply Card opposite page 18 and circle No. 330





The Sherman Major backhoe has a 180-degree arc of swing, can reach down 12½ feet, and clear a height of 8-2/3 feet.

### Power digger capable of reaching 12½ feet

■ Sherman Products, Inc., has introduced a hydraulic backhoe designed for use on Fordson-Major tractors. The Sherman Major is a heavy-duty unit which reaches as deep as 12½ feet. With a 180-degree arc swing it can clear a height of 8⅔ feet for loading trucks.

Features of the machine include twin crowd cylinders, said to provide extra balanced power for fast, efficient digging through any soil.

The digger is of heavy steel-plate construction with large-diameter hinge pins, replaceable hardened steel bushing, and heavy-duty steel castings.

The bucket linkage is said to permit maximum wrap-around and also a stroke of up to 5,000 pounds effective pressure through nearly 9 feet of bucket lip travel.

For further information write to Sherman Products, Inc., P. O. Box 430, Royal Oak, Mich., or use the Request Card that is bound in at page 18. Circle No. 44.

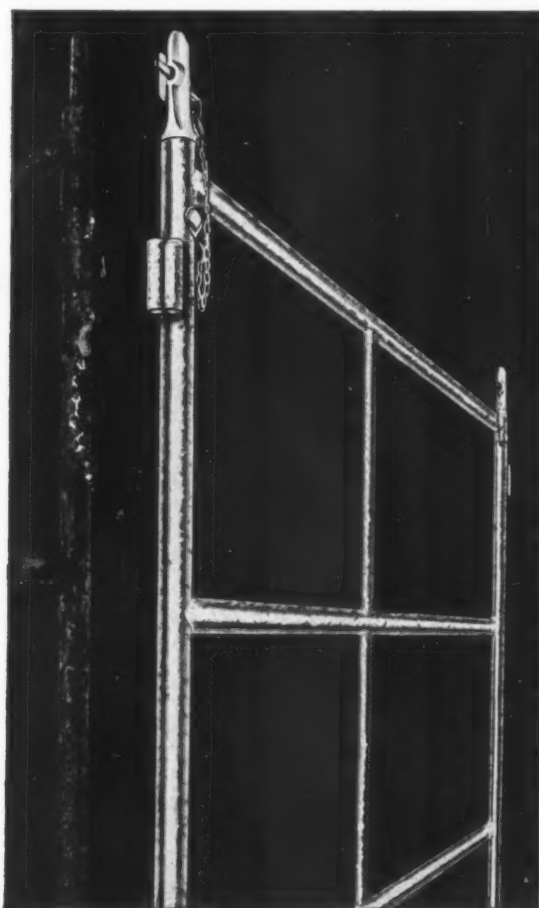
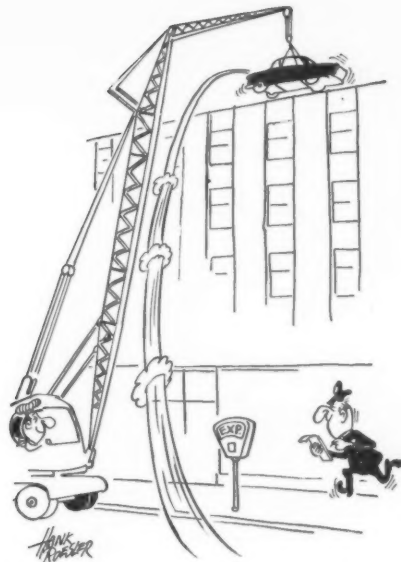
### Uses of powered buggies

■ A brochure from Prime-Mover lists the advantages said to result from the use of powered buggies on many jobs. Some advantages cited are that powered buggies can be used on all jobs, that they can handle other materials besides concrete, and that they will reduce the size of a crew needed during pours. Other topics covered are speed, cost, haulage, and operator ease.

To obtain this brochure write to Prime-Mover Co., Sampson St., Muscatine, Iowa, or use the Request Card at page 18. Circle No. 66.

### Charles Bruning Co. names director of merchandising

James E. Patas has been assigned to the new post of director of merchandising for the Charles Bruning Co., Inc., manufacturer of Copyflex reproduction machines and materials. Joining the firm's Seattle, Wash., branch in 1946, he was named office manager a while later. He has been a member of the Seattle sales staff for the past five years.



## It's a problem of 'skin protection'

*in your scaffolding too!*

Has it ever occurred to you that there is a "skin protection" problem with steel scaffolding? And have you as a construction man ever stopped to think how important this protection is? If your men spend costly hours in assembling and dismantling rusty, pitted scaffolding then you know that rust is expensive—it slows up your erection time and definitely shortens the life of your scaffolding.

What then is the answer to the problem of rust?

It's the *galvanized* protective coating used exclusively on UNIVERSAL EZEBILT SCAFFOLDING. Now every single part of this top-quality scaffolding is covered with a lastingly smooth lubricative surface of

galvanizing. It resists rust, lasts longer, is far easier working, remains looking better on the job with no costly maintenance—and at no extra cost. Universal Galvanized answers the most urgent need in the scaffold industry since the no-loose-parts feature of Gravity-Lock. Insist on galvanized scaffolding—specify Universal Galvanized.



Send for catalog

**UNIVERSAL** *the only* **GALVANIZED SCAFFOLD**

UNIVERSAL MANUFACTURING CORP. • ZELIENOPLE 1, PA.

For more facts, use Reader-Reply Card opposite page 18 and circle No. 265

## Million yards of clay moved in grading railroad yard

The moving of a million cubic yards of earth has cleared the way for the installation of buildings and modern equipment at the 7-mile-long \$6 million freight classification yard being built by the Great Northern Railway at Minot, N. Dak., to speed and improve freight service over its lines. The big yard parallels the main line from the west coast, which splits near Minot to go east to Duluth, Minn., and southeast to Minneapolis and St. Paul.

When the project is completed about the first of August, the yard will contain a total of 55 miles of track. Automatic retarders, devices that measure the rollability of the cars by means of weight and radar, and other automatic devices will control the rolling stock on the 40 classification tracks and six receiving and departure tracks in the yard.

A car repair shop, freight house and transfer platform, a yard office with a 5-story control tower, and a diesel service area containing a service building, diesel engine inspection pit, and facilities for fuel, water, and lubrication, will be completed by the end of this summer. Storm and sanitary sewers and water facilities for all buildings will complete the setup.

One of the two principal contracts awarded by the railway—for excavating and placing more than a million cubic yards of earth for the grade plus 200,000 cubic yards of gravel surfacing—went to Megarry Bros., St. Cloud, Minn. Building construction was done by Roel Construction Co., Inc., Fargo, N. Dak. Great Northern track crews are laying the ties and rails and placing the ballast, while the railway's signal, electrical, bridge, building, and mechanical departments are installing most of the equipment.

### Scrapers have long haul

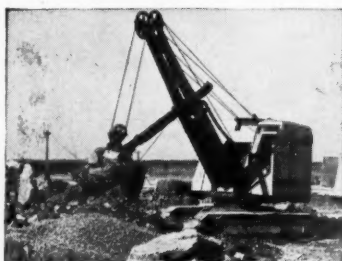
Water and frost provided most of the trouble when grading started last spring. The heavy yellow clay held surface water in small pockets, forming the potholes and swamps so common to this part of North Dakota. Megarry first drained the area by digging a 4-mile-long ditch along one edge of the yard area. After two Bucyrus-Erie 22-B draglines with  $\frac{3}{4}$  and 1-yard buckets had dug this big trench, concrete pipe lines were run from the trench to drain all areas of the yard.

While the trench was being dug, the spread of six Caterpillar DW21 scrapers moved in and began hustling the million cubic yards of material into place. Assisting the scra-

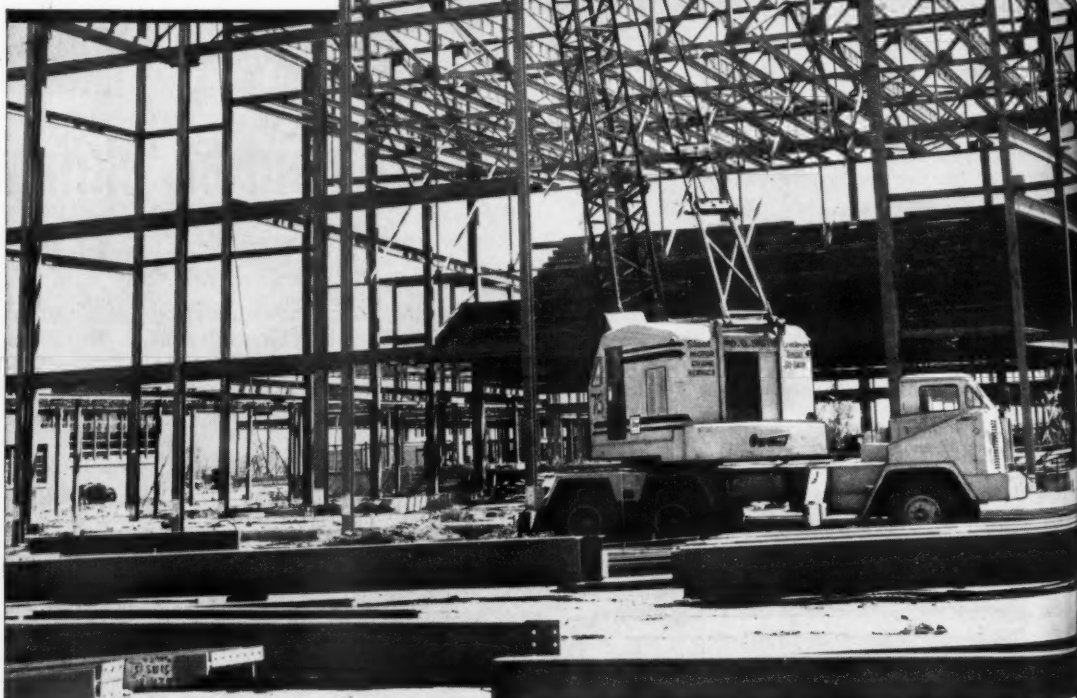
pers on the loading cycle were an Allis-Chalmers HD-20 tractor and a McCoy Special Caterpillar push-tractor. A pair of Caterpillar D8 tractor-dozers worked over the material as it was placed on the embankments.

The exceptionally long hauls needed to build the grades for the hump tracks and the long approach tracks gave the big scrapers a chance to show off their speed. On a haul of between 9,000 and 10,000 feet from a

hillside borrow area to one of the hump tracks, the DW21 scrapers made a round trip in an average of 17 minutes, delivering an 18-cubic-yard payload. This time included the loading and unloading cycles.



**More for your money in excavators.** Built and backed by specialists in  $\frac{3}{4}$  yard machines, Gar Wood excavators give you power steering for better maneuverability... independent travel while swinging for faster loading cycles... fluid coupling that absorbs digging shocks... independent chain crowd that puts more engine power into every bite. And, only Gar Wood gives you a complete selection of front-end attachments, including the exclusive Foundation Borer that digs up to 26 unreinforced footings per day!



**More for your money in truck cranes.** Gar Wood 75BTs give you the right combination of heavy-duty capacity and multi-job mobility for both construction and materials handling work. Live, 2-speed boom hoist with full power

## gives you more for your money PUTS MORE PROFIT

In industry, in construction and in local government, men who know equipment value have come to expect more for their money from Gar Wood Buckeye. A comparison will show you why.

First, compare productivity... not just rated capacity alone, but the actual output per day on a given job. You'll find that Gar Wood Buckeye machines make the most of every minute. Operation is faster, easier... operator control is positive and accurate... adjustments for changing job conditions and conversion to meet different job requirements can be handled in less time.

Next, check on-the-job availability. The G

for lifting and lowering... complete and accurate control at all times... optional hydraulic coupling for smoothest operation... complete, easy convertibility. All these advantages add up to safe, economical handling of 20-ton loads.



A Caterpillar DW21 scraper picks up a load of heavy yellow clay in the borrow area with a wheel-loading assist from an Allis-Chalmers D-20. A 4-mile-long ditch, excavated along one edge of the site before grading began, helped drain the yard area.

C&E Staff Photos

An 18-cubic-yard payload is dumped on one of the fills by a Cat DW21. The rough material on the face of the fill is made up of chunks of the clay. Scrapers usually completed a loading and dumping cycle on a 9,000 to 10,000-foot haul in 17 minutes. ▶



Some of the long single-track fills were troublesome to build, because there was not room for the scrapers to turn around or even pass each other on the narrow top and the 1½ to 1 side slopes were too steep for the

equipment to operate safely. So, after dumping their loads, the rigs went on over the end of the fill and back to the borrow area on a separate haul road.

Since the embankment for two long

hump tracks had a 40-foot top, the scrapers could pass and turn. The embankment for these tracks was built up as high as 20 feet, requiring a large volume of material to be hauled a long distance. The average

haul for all of the material on the job was estimated to be 1¾ miles.

For some of the very short hauls, and for finishing operations, the contractor used a Caterpillar D8 tractor with a LeTourneau FP scraper. Compaction of the heavy clay material to a density of 95 per cent Proctor was done continuously by two 3-drum Bros sheepfoot rollers pulled by Caterpillar D7 and D8 tractors. The heavy equipment operating over the fills also assisted in the compaction. Finishing operations were handled by three Caterpillar No. 12 motor graders.

#### Two 10-hour shifts

In order to complete the entire grading and gravel surfacing operation in one season, Megarry Brothers operated its grading spread two 10-hour shifts six days per week. Since work was carried on after dark, headlights on the scrapers and tractors were maintained in good condition to insure visibility and safety on the long haul roads. Loading and dumping areas were floodlighted by a group of Onan and Kohler portable generator units. Most of these were 3,000 to 5,000-watt trailer-mounted units, with pipe standards and floodlights, which were quickly and easily moved from place to place as the work progressed.

#### Gravel surfacing

In addition to building the grade

Portable lighting units like this Onan 5,000-watt plant are used to illuminate the fill areas after dark.

## More for your money- Profit into EVERY JOB!



**More for your money in wheel-type ditchers.** Only Gar Wood-Buckeye gives you a live hydraulic wheel hoist for faster, more accurate positioning of digging wheel...hydraulic conveyor drive for instant adjustment to handle any volume of spoil...plus tractor-type crawlers, simplified group controls, tapered rooter bits. Such advantages as these explain why contractors make more profit on ditching contracts when they bid 'em with Buckeye!

Wood-Buckeye line is designed to stand up in rugged day-in day-out service... built to give you the production you need when you need it. Maintenance is easy. You'll find more anti-friction and sealed-for-life bearings... easier accessibility to components for periodic checks... unit construction for faster field servicing.

This adds up to more production per dollar invested... more profit from every job! Call your Gar Wood-Buckeye dealer and find out more about the way your equipment dollars work harder in this advanced line. Or, write to: Customer Service Department, Gar Wood Industries, Inc., Wayne 3, Michigan.



**More for your money in finegraders.** Power Finegraders by Buckeye insure greater paving profits because they cut the grade faster and more accurately... protect you against penalties for thin slabs that are too thick. One man easily controls the Finegrader, produces up to 420 feet of a 24-foot grade per hour, and exactly to specifications. For extra profits, put a Finegrader on your next paving job.



**More for your money in spreaders.** Gar Wood-Buckeye surface material spreaders give you the speed you want, the accuracy you need to distribute sand, gravel, slag, salt and ashes at lowest cost. Hitching is fast, safe and automatic. Flow is accurately regulated for either uniform or tapered spread... from a mere sprinkle up to 2½-inch thickness. Width of spread adjustable in 6-inch steps. You get fast, positive spreading regardless of material, truck speed or direction.



**More for your money in ladder-type ditchers.** Only the Buckeye 407 ditcher offers push-button conveyor shift to speed work around obstructions... plus independent lever steering, speeds you can find and use, instant hydraulic boom control and many other features for easier operation, more production. The 407 is far easier to operate, control and adjust than any other ditcher in its class... big reasons why it's the world's largest selling ladder-type machine!

### GAR WOOD INDUSTRIES, INC.

Wayne, Michigan • Findlay, Ohio

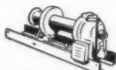
Plants in Wayne and Ypsilanti, Mich.; Findlay, Ohio; Mattoon, Ill.; Richmond, Calif.



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Winches



Gar Wood  
Tractor Equipment



Gar Wood-St. Paul  
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Gar Wood-Buckeye  
Hi-Way Wideners

For more facts, use Reader-Reply Card opposite page 18 and circle No. 266



The two bridges crossing a roadway near the site are also being constructed by the grading contractor. Here transit-mix concrete for a bridge pier is bucketed to the forms by a Bucyrus-Erie 22-B crane.

C&E Staff Photos

for the 55 miles of track in the yard, the grading contractor placed a 10-inch lift of gravel surfacing and built two bridges to carry the tracks over an intersecting road. Material for the surfacing was obtained from a pit on the railroad property near the job site and trucked into place by a fleet of dump trucks.

In the pit, two Caterpillar tractors, a D4 with Traxcavator front-end loader and a D8 with dozer, pushed the gravel up to a trap. A Pioneer conveyor carried the material from the trap up to a grizzly that removed the oversize and dumped the remainder directly into the trucks. During this operation, as much as 2,500 cubic yards of material was produced per day and 200,000 cubic yards was turned out during the season.

After the surfacing was dumped at the job site, it was bladed to finished grade by one of the motor graders. This proved a slow operation on some of the narrow grades, because the trucks could not operate through the loose gravel and could not turn around or pass each other on the narrow fill. Each truck had to back the length of the fill, dump its load, and come back empty before the next truck was able to place material.

#### Bridge work

The two bridges carrying the tracks over a road are steel beam structures on concrete piers that were founded on treated timber piles. One of the spans has an open timber deck; the other has a ballasted deck.

Timber piling was driven by one of the contractor's Bucyrus-Erie 22-B cranes with swinging leads and a Vulcan 3,000-pound gravity hammer. Then the forms for the concrete piers were built of lumber tied with Universal form hardware. Concrete was supplied by Atlas Ready-Mix Co., Minot, in Smith transit mixers mounted on International R-190 trucks. The 22-B brought the concrete to the forms in a 3/4-yard shop-

built bucket, and as the material was placed it was consolidated by a White gasoline powered mechanical vibrator.

#### Railroad crews lay track

As soon as any portion of the grading and surfacing was completed, the Great Northern track crews moved in and began track laying operations. Ties received from the treating plant in steel-banded bundles were unloaded by a crane and placed by hand. A small railroad crane swung the rails from the delivery flat car into place on the ties, and workmen drove a few spikes by hand to hold the rail in gage.

Crews using Nordberg gasoline-powered spike hammers placed the rest of the spikes rapidly. Whenever

it was necessary to drill the rails for angle bars, the workmen used a gasoline-powered Nordberg rail drill to finish the holes quickly and accurately and with a minimum of labor. Even the bolts for the rail splices were tightened mechanically, a Nordberg track wrench being used for the job.

Aside from the track crews, several other railroad crews are at work on the project. The bridge and building crew set up several Armco steel buildings on the site and erected the high floodlight towers which will illuminate the yard. Signal, electrical, and mechanical crews are busy installing special equipment in the yard.

The Roel Construction Co. contract included the construction of \$850,000 worth of buildings. Among these were

a car repair building measuring 150 x 300 feet, a 40 x 150-foot yard office with a 5 story control tower, a diesel engine inspection pit, and a freight house and transfer platform. The latter unit measures 102 x 600 feet and encloses four tracks. The dock is equipped with a Towveyor truck-conveyor system in the floor.

To provide concrete for the building construction, Roel set up a batching plant and transit-mix operation which was operated by Bismarck Ready Mix Co., Bismarck, N. Dak. The simple plant consists of a CMC batching outfit and a covered conveyor leading to the transit mixers. Aggregates were fed to the CMC bins by a Ford tractor with a front-end loader. Cement was supplied directly from a hopper-bottom car through a



**Gets back  
on new slab  
sooner**

**speeds paving schedules**

#### KOEHRING 16-E *twinbatch*®

paver on rubber tires is as mobile as your batch trucks. It works on or off-pavement — can get back on new slab in as little as 7 days to pave adjoining highway strips, scattered intersections, approaches to driveways and side roads. This time-saving "run-about" makes self-powered moves at 9 m.p.h. Yet, for all its mobility, the Koehring 16-E *twinbatch* is primarily a production paver — exceeds the output of large single-drum pavers on main highway work. For instance —

On straight-production paving, the Koehring 16-E hits a top output of 86.7 batches an hour (based on 60-second mixing cycle). This reserve production capacity with *twinbatch*

Autocycle mixing offsets normal job delays — lets you pick up lost time which cannot be made up with a limited production single-drum paver.

#### Averages 50 cu. yds. an hour

As a result, the Koehring 16-E *twinbatch* easily maintains an average of over 76 batches an hour — 8 hours a day. Based on 16 cu. ft. per batch, plus the usual 10% overload, this assures you 50 cu. yds. of concrete per hour — with a small crew — on your main-highway paving jobs.

While its usefulness is unlimited as a general-purpose paver, this versatile Koehring 16-E also serves as a mobile concrete mix plant. On construction of curbs, gutters, culverts,

bridges, pilings, it discharges into overhead hoppers, forms, chutes, or loads trucks. Elevating boom reaches up and out 60° — gives controlled discharge at 21-foot height (higher with special boom).

**See for yourself** how the big production capacity, overall versatility, and rubber-tired mobility of this Koehring 16-E *twinbatch* can put you miles ahead on your paving schedules. Get all the facts from your Koehring distributor, or write us for 16-E catalog. Big 34-E *twinbatch* is also available for major highway, airport paving.

**KOEHRING Company**  
Milwaukee 16, Wisconsin

(Koehring Subsidiaries: JOHNSON • PARSONS • KWIK-MIX)

CONTRACTORS AND ENGINEERS





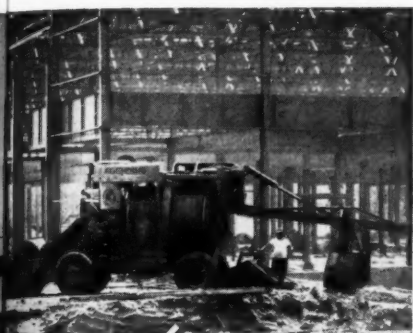
Mayrath conveyor of the type normally used for handling grain. The batches were dumped to the boot of the belt conveyor, which transported the material to the transit mixers. Water from a well at the site was stored in a large tank near the bins.

#### Personnel

J. Ernest O'Brien was general superintendent for Megarry Brothers on the grading and surfacing operations. Harvey Home supervised the bridge, water supply, and drainage operations. Stuart Wright is superin-

Gravel for the 10-inch surfacing is loaded into a Ford dump truck at the gravel pit. Gravel pushed up from the pit by a Cat D4 with Traxcavator front-end loader goes to a trap feeding the Pioneer conveyor, equipped with a grizzly to remove oversize.

Dry batches for structures are carried from a CMC batching plant by a Mayrath conveyor to a Challenge 3-yard truck mixer. Mixing water is supplied from the tank in the background.



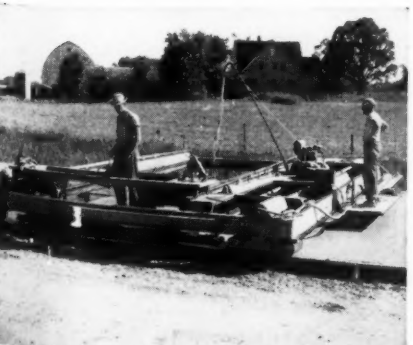
#### 16-E serves as mobile mix plant—

pours footings, floors, columns, is never "grounded". Power-controlled boom swings in a 160° arc, or elevates 60° for overhead discharge. 24 cu. ft. bucket dumps anywhere along 25-ft. boom, has controlled discharge.



#### Big production 34-E twinbatch

hits a top output of 86.7 batches an hour (60-second mixing time). This reserve work capacity offsets normal production delays, assures an average of 50 batches an hour, 8 hours a day when you use a Keohring 34-E.



#### Keeps up with any paver—

"Timely", precision finishing is important on every paving job. Operating at almost twice the speed of a 34-E paver, Keohring Longitudinal Finisher handles all practical consistencies of concrete: harsh, wet, dry.



#### Digs within 12 inches of side obstructions

Off-set digging boom on Parsons 250 Trenchliner® puts trench within 12 inches of curbs, poles, buildings — digs almost directly behind either crawler. Reversible conveyor shifts through machine by power in less than 1 minute, discharges right or left. 250 production capacity: 3½ inches to 9½ feet per minute. Widths: 16 to 42 inches. Depths to 12½ feet. Four other Parsons Trenchliners are also available in all sizes and types.

PARSONS • Newton, Iowa  
(Keohring Subsidiary)



#### Portable, easy-charging 3½-S Dandie® mixer

With this Kwik-Mix ½-bag concrete mixer, charging height is low, only 43 inches. Convenient end-discharge, easy tilting drum, and unobstructed spotting area speed loading into wheelbarrows. Push down tow-pole gives safe, 1-man handling on the job, is easily hitched for trailing. Other models: side-discharge tilter, end-discharge non-tilt. Other concrete mixer sizes up to 16-S. Also: plaster-mortar, bituminous mixers and Moto-Bugs®.

KWIK-MIX • Port Washington, Wis.  
(Keohring Subsidiary)



#### 254 to 1321-barrel bulk cement plants

Easy to ship, simple to erect and re-assemble at next site, Johnson silos are all-welded in one piece, 11 or 12 ft. diameter. Single silo capacities: 254 to 611 bbls. Has screw conveyor, bucket elevator, receiving hopper, one or two 1,000-lb. batchers. Larger batcher, extra leg and elevator height available for charging mix trucks. Second silo at ground level increases total plant storage capacity up to 1321 bbls. of cement.

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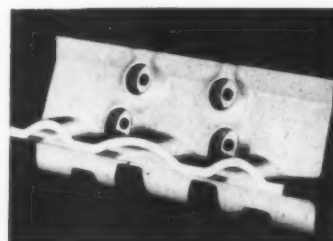
tendent of the building operations for Roel Construction Co. Construction engineer for the Great Northern is C. F. Intikofer. Division superintendent of the Minot Division is R. W. Downing. District engineer is L. G. Reichert, who is located at the road's Duluth office. Chief engineer is R. R. Manion of the general office in St. Paul.

THE END

#### Track-type grouser shoe has more surface contact

■ A new track-type grouser shoe designed to give 15 per cent more surface contact without increased width has been announced by the Shunk Mfg. Co.

Called the Gripper grouser shoe, the new track shoe obtains its extra



surface area by means of a grouser shaped in the form of several continuous curves, thus providing more surface area within the same overall width of conventional straight-across grousers.

Gripper grouser shoes are made from manganese steel. Grousering bars are available from the manufacturer for quickly rebuilding worn grousers without removal.

The shoes are available for replacement on Allis-Chalmers, Caterpillar, and International machines.

For further information write to the Shunk Mfg. Co., Bucyrus, Ohio, or use the Request Card at page 18. Circle No. 34.

#### General Tire & Rubber appoints sales official

The new assistant manager of commercial sales for the General Tire & Rubber Co., Akron, Ohio, is William C. Weirath. In his new post, he will assist Karl A. Dalsky, commercial sales manager, in directing the sales of truck and other commercially-used tires.

The engineering department

## The organization of quarters, and filing and cost systems



by **GEORGE E. DEATHERAGE, P. E.**  
Construction Consultant



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A TYPE FOR EVERY DIGGING PURPOSE  
1/4 to 40 Cubic Yards

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If a firm has contracted to build a project of the industrial type, and engineering and drafting is to be done at the job site, all information necessary for the design is assembled first. Plant construction information will come from design reports and flow sheets.

Flow sheets are simple sketches, many times not even drawn to scale, showing the relative position of major equipment items. Rough outlines may indicate the building or buildings that will house manufacturing equipment.

The design report tells the story in words. It refers to each building or item of equipment by number, type, size, and other specifications. This report carries the story of the process from start to finish, and it includes such things as copies of all pertinent correspondence, sketches, computations, design investigations, test results, field information, distances from railroads and highways, housing facilities and requirements, and detailed drawings and specifications of equipment to be installed.

Many large construction engineering firms, in addition to doing design work and construction, may assist in selecting a site for a proposed plant. In such a case, a number of points should be considered. The contractor has to place himself in the position of the manufacturer when selecting a site.

First of all, the site must be near enough to the plant's supply of raw materials so that freight charges on the material are kept to a minimum. The nearby location of transportation facilities—railroads, roads, waterways—has to be taken into account so that costs are kept low as the finished product is shipped to market.

The nearby supply of labor, housing for employees, prevailing wage rates, cost of the property, the tax rate, and many other items will have to be considered. Information on all these problems should be compiled by the superintendent or project manager so that it can be passed on to those concerned with the plant's design.

In organizing an engineering department for work on a plant, the number of subdivisions needed in the organization chart—for equipment, electrical work, piping, and so forth—can be determined from the character

**CONTRACTORS AND ENGINEERS**



This is the fifth of a series of articles on Construction Management by George E. Deatherage, P. E., construction consultant. The articles are based on an eight-volume "Manual of Advanced Construction Management" published by Geo. E. Deatherage & Son, P. O. Box 921, Lakeworth, Fla. The manual is used in a training course for superintendents and project managers, and is directed primarily at those contractor employees who have reached the foreman level or its equivalent, and who need practical help in order to take complete charge of construction projects themselves.

of the plant as developed from an analysis of the flow sheets and design reports. One or more key men will be required for each specialty.

The number of engineers, draftsmen, and other men needed can roughly be determined by analyzing the job. If records of previous jobs are not available, this information may be obtained from the estimated engineering cost, by dividing the weekly or monthly rate into the total estimated cost, then projecting this analysis within the time allowed for drawing or completion.

#### Engineering quarters

Once the proper type of engineering department has been developed for a specific job, a temporary drafting room at the site, adequate for personnel to be employed, should be stocked with furniture, equipment, and supplies. The superintendent or project manager may find it wise to draw up a list of items required, a list which includes everything from drafting tables and boards to steel shelving for supplies, water coolers, mail baskets, fans, clocks, paper towels, pencil sharpeners, protractors, blueprint racks and cabinets, and miscellaneous small tools.

A standard should be set for the drawing room, so that a specific type of paper or cloth is used for each class of work. All drawings eventually to be traced on cloth should be made on paper tracing so that prints can be made for current construction.

Standard-size sheets should be used for all drawings, and a schedule prepared for engineers and draftsmen to follow, designated in this manner:

24 x 36-inch	A sheets
18 x 24-inch	B sheets
12 x 18-inch	C sheets
9 x 12-inch	D sheets

If the proper letter precedes the drawing number of the title block, filing will be made easier. From this data, the required supply of paper and cloth can be ordered, preferably with printed title blocks.

All draftsmen should use the same scale for a definite class of work. A schedule governing this work might call for piping and piping elevations to be drawn at  $\frac{3}{8}$  inch, structural drawing at  $\frac{1}{8}$  inch, general building drawings at  $\frac{1}{4}$  inch, general building details from  $\frac{1}{2}$  to 1 inch, and piping details from  $\frac{3}{4}$  to 1½ inches.

Each draftsman should use identical symbols for indicating the various materials being used, since it would

be confusing to have sets of plans differing in this regard. Standardized abbreviations should be used by everyone. Commonly used materials may be indicated as in Figures 1, 2, and 3 on the following pages.

Graphic symbols for mechanical and electrical work, published by the American Society of Mechanical Engineers, cover heating, ventilating, air conditioning, and allied work, and since these are generally understood by workmen in the various trades, it is important to use them.

Standard specifications for many

classes of work, including building trades, mechanical and electrical trades, roads, and airport construction, are in common use in many sections of the country. These standards should be used wherever practical. If they cannot be adopted in their entirety, they will serve as useful guides in preparing specifications. Use of the standards will save time in the field and office, and permit uniform bids to be made faster.

Nearly all the trade and professional associations have compiled standard specifications on the par-

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## RESEARCH



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Salt Lake City, Utah; San Francisco, Calif.



ticular specialties, and these standards may be secured from any of the associations for a nominal sum. Similar information is also available from the U. S. Bureau of Standards, the National Research Council, and similar agencies in Washington, D. C.

By writing the various trade associations, you can be placed on their mailing list for any releases. These will help to build up a file on the latest developments in each trade. This material will be invaluable when specifications have to be written.

Special specifications for materials and workmanship may be found in trade volumes like "Sweet's Catalog"

or "Thomas' Register." Standard types of material specifications may be secured from the American Society for Testing Materials, or one may refer to federal government specifications.

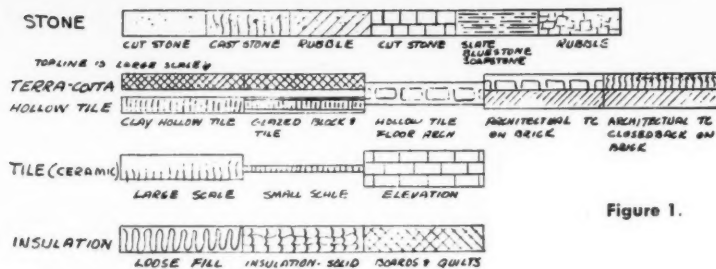


Figure 1.

#### Filing systems

The American Institute of Architects has devised a standard system and procedure for indexing and filing design data, flow sheets, catalogs, specifications, engineering field books, estimates, contracts, and other papers. A copy of the AIA manual can be secured from the organization for a nominal sum.

A simple system I have devised lends itself well to work involving a great deal of mechanical or electrical detail as well as building work.

This is a three-number code, the first number, say 1879, indicating the contract or job. The next two numbers identify the object or subject in detail. This system makes it possible for all matter dealing with any one specific contract to be filed in drawer or cabinet space specifically allotted to the job. As material enters the office, it can be stamped with a rubber stamp so that spaces are left for data number, file number, and the date filed.

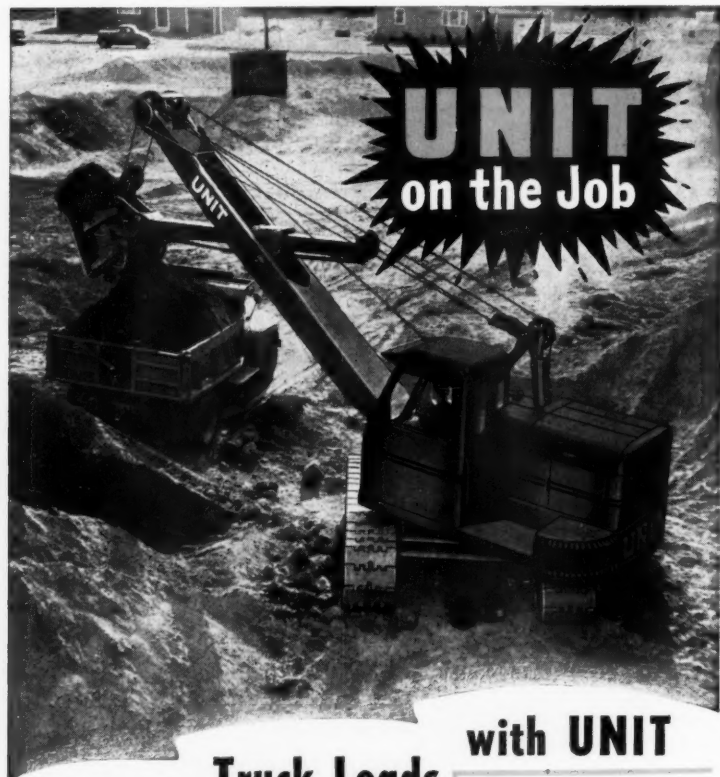
If the data consists of sheets of engineers' computations on substructure footing reinforcing, Contract No. 1879, the contract number would be posted, followed by a dash, the figure 5, denoting the cost code number for concrete footings, another dash, then the figure 7, the cost code classification for reinforcing steel. The entry number, 1879-5-7, will identify the subject matter as being for contract No. 1879, concerning footing reinforcing. The number of the filing case is entered on another line, followed by the date.

Then, if outgoing mail concerns substructure footing reinforcing, the code number 1879-5-7 will be listed on the correspondence. If the system is used, it is important that only one subject be covered in any one memorandum or letter. The advantage of such a system is that all information for a specific contract is to be found in one place.

In addition, as we shall see later, the last two numbers of a three-number code can be identical with the unit cost code (5 for concrete and 7 for reinforcing). Then, as the estimates are made, materials billed, requisitions written, and purchase orders prepared and labor performed in the field—the cost code charge appearing on all papers—materials and labor charges will automatically be compiled as the work progresses from engineering to job completion.

If the file clerk is the only person with access to the files, a record of all material may be kept properly and its location known at any particular time. A printed "out card" should be

substituted in the file for any material removed. This should identify the subject matter of the file, the department or person currently using it, and the date it was taken out. When material is replaced, the return date



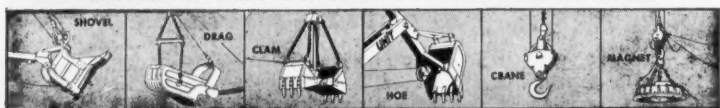
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GREENLEE Pushers are available in two sizes: No. 790 for  $\frac{3}{4}$ " to 4" pipe . . . No. 795 for pipe over 4", concrete sewer pipe, large ducts. Average performance of No. 790, shown above with power pump, two feet per minute. Write for literature.



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**CONTRACTORS AND ENGINEERS**



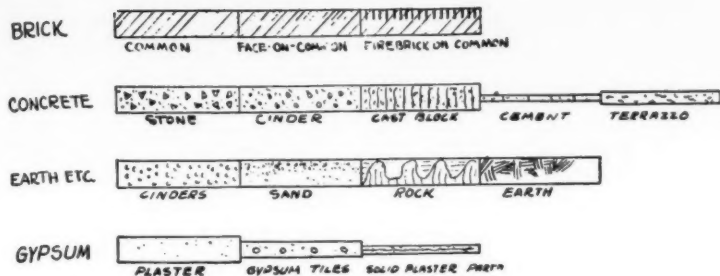


Figure 2.

## Materials Symbols

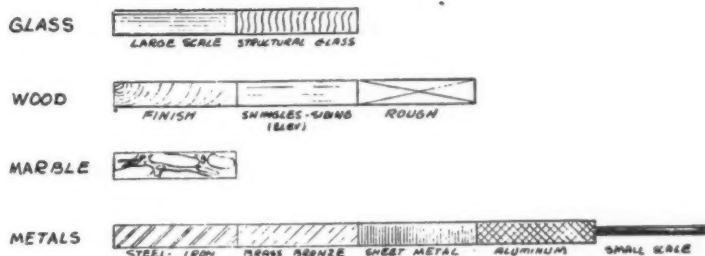


Figure 3.

may be entered on the "out card."

### Filing catalogs

It is a common practice to file catalogs under a decimal index classification in most engineering offices. Few engineers or draftsmen are interested in securing a catalog put out by one manufacturer; usually they want all data available on a specific subject. Such an index system might be set up so that number 50 would identify condensers. Then 50.1 would identify shells; 50.2, heads; and 50.3, tubes. This system makes it easy to number and file incoming catalogs. "Out cards" such as those previously described, may be used to control the circulation of the material.

### Unit costs and cost systems

As emphasized before, the only safe, practical, and useful costs for reference are one's own. All others are at best only approximations that do not reflect conditions under which the work was done. These "guesstimates" and published "handbook costs" or estimating units fall into the same category.

Some successful contractors do not have cost systems, but this is usually because the estimates are made or checked by some old-timer who has come up from the field, accumulating an immense store of knowledge concerning the man hours needed to do various kinds of work. He knows, from experience, how much certain work should be done for, and he automatically makes allowances for job conditions.

The major reasons for costing in construction are to create a historical record for future bidding, to check the costs of the work against the estimated costs, to stimulate the desire for lower costs, to enable something to be done about high costs during the progress of the job, and to create a cost record of individual items for tax purposes.

A cost system should not be broken down into more functions or operations than are used in a practical sense by an estimator. This leads to unnecessary work, greater overhead cost, and, eventually, abandonment of the cost system. Unit classifications should be as few as possible to make operations simple.

It is usually not practical to attempt to record and check costs for erecting batterboards or bulkheads, or for similar small operations which can be allowed for by the estimator. Spot checks of these small items will be sufficient to give the estimator a foundation for future allowances.

For ease of operation, it is usual to break the work down into various main classifications, and to identify these classifications by number. A breakdown for simple building operation—  
(Continued on next page)

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"Retract-A-Turn"—another Clipper FIRST. Cuts line-up time in half! Dual Caster Wheels AUTOMATICALLY take over load when blade is raised out of the cut... lines up instantly in any direction without lifting or tilting! Lower blade into the cut... caster wheels are automatically raised... then you saw on 4 rubber-tired wheels... giving you straight line cutting without drift to either side.

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**DIAMOND BLADES** for any job—any aggregate—every saw! Choose your Clipper Diamond Blade from a wide variety of specifications to cut green or old concrete with outstanding speed and economy. **GREEN-CON BLADES** give you savings as high as 80%—with completely new series of "Green-Con" Reinforced Abrasive Blades that let you cut "green concrete" with the widest possible range of HARD to SOFT Limestone Aggregates.

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## management

tions might include 29 numbered classifications, ranging from general conditions through excavation and backfill, concrete, concrete forms, reinforcing steel and mesh, structural steel, lath and plaster, carpentry painting, electrical work, walks and driveways, insurance on labor and materials, and overhead and profit.

Such a breakdown is not detailed enough to serve a useful purpose in building up units to be used either for estimating or control, mainly because each item listed covers more than one class of work. A classification for ceramic tile, including marble and slate, would not make it possible to

ascertain how much was spent on tile, marble or slate. The only possible use for such a single-number breakdown would be to note the amount of money spent for tile, marble, and slate, and check this against the total amount of money allowed. This would merely show whether or not this part of the work was being done over or under the estimate.

### Two-number codes

Contractors usually employ a "two-number" classification to get definite unit costs for various classifications of work.

This type of code might have ceramic tile listed under number 19.1 while marble would be listed as 19.2 and slate as 19.3. This would permit the labor for each of these classifications to be isolated so that a unit price can be figured for each class of work.

The trained estimator will have listed his quantities and labor separately for each of these items, and the costs of work in the field can then be compared directly with estimated costs.

The estimated check list may contain as many as 2,500 items that are likely to appear in a building operation. All of these are covered by the cost code, a copy of which, in pocket-edition form, should be given to each foreman or interested party.

The operation of the code is not as complicated as it appears to be at first glance. A foreman generally is limited to the direction of work under his specific trade, and he will actually use about five per cent of the items noted. These he soon commits to memory. The unusual items he needs to use can be readily located by referring to the code.

### Three-number codes

The "three-number" classification in cost codes is not in general use by

contractors, but by large corporations operating their own construction division. Their use is required by the fact that tax regulations permit a piece of equipment to be depreciated each year. Taxes and reserves for replacement are calculated on these costs. This means that the cost of each item of equipment—anchor bolts, direct connections, grout, and so on—must be isolated and recorded.

The "three-number" system permits a permanent cost and tax record to be built up. Under this system, Bills of Material, itemizing all things entering into the construction and installation of any single item, are numbered to key them to both the drawings and the cost code. Each building or piece of major equipment

is given a number which identifies it on the drawings and all other documents.

A motor-driven pump might be given the number 167, for example, and the second number, say number 5, would identify the main subclassification, concrete. If the third number is number 2, it would refer to the placement of concrete. The charge for the concrete materials in the pump foundation would appear as 167-5, while the labor involved in placing it would appear as 167-5-2.

The mechanics of this system first involve the preparation of the properly coded Bill of Material in the engineering department. Copies are then issued, along with drawings and specifications, to all interested parties. The



Grousers: available in regular, semi, or flat types; all standard widths

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There are two reasons why these tracks give you longer service, even under severest working conditions: (1) KENSINGTON's new, improved design, and (2) superior, wear-resisting alloyed manganese steel.

**New Design.** Rigidity and near-perfect alignment are made possible by one-piece rail design and special heat-treated alloy pins pressed tightly in place under high pressure. Anti-shear lugs on grouser plate fit snugly over tie bar of link to eliminate loose plates, elongated bolt holes, twisting, weaving, and side-sway... the most common causes of bolt loosening and track trouble. Grousers are heaved-up at all critical points to better resist bending and breaking.

Yet, despite all these improvements, KENSINGTON Track Assemblies fit all standard, popular make crawler tractors.

**Steel with Stamina.** Special, hard, tough, KENSINGTON-developed alloyed manganese steels actually fight back against wear! They constantly develop extra surface hardness when exposed to friction, abrasion, and impact.

KENSINGTON tracks come from the factory ready-assembled, easy to install.

**Discover** for yourself how much KENSINGTON tracks will lower your maintenance costs and improve your operating efficiency. Coupon will bring details.



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Make of tractor \_\_\_\_\_ No. tracks \_\_\_\_\_

Model \_\_\_\_\_ per belt \_\_\_\_\_

Width of grouser \_\_\_\_\_

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CONTRACTORS AND ENGINEERS



purchasing department checks the bill for small items that can be secured from stock, and all requisitions and purchase orders are keyed by number to the pump. As materials are received or allocated, the storekeeper makes a record of them on the bill. When all the materials are available, a "Bill of Material Complete Report" is issued to all parties concerned so that they can start and complete construction without delays. This helps lower field costs, since jobs will not be started and then held up for lack of a vital piece of material.

Meanwhile, the estimator has completed the estimate for the work and distributed copies of it to all interested persons. The work time of the field forces installing the concrete

foundations and the pump and motor is charged to Pump No. 167.

Invoices for the materials come into the accounting department keyed to the purchase order and Pump No. 167. Labor charges, added to this, complete the record of the cost of installation. The cost department—which may be included in production or planning—checks the cost against the estimate. If the job is small, the results may not be given to the project manager until the work is complete. If a job is large, a weekly report should be made so that if actual costs are not in line with estimated costs, some corrective measures can be taken.

This method is costly and extensive, and it is justified only on large

work where installations must be valued for tax purposes. If the work had been completed and no detailed records kept, engineers and accountants would have to be brought in to estimate and accumulate this record, a procedure that would be more expensive than keeping detailed records throughout the course of the work.

#### Field functions in costing

The charging of man hours to the class of work being done, and the measurement of the quantity of work accomplished, can be done on either a daily or a weekly basis. Usually, this is done once a week, but there is a visual system that permits unit costs to be automatically presented on a daily basis. In this system, the superintendent or project manager has actual unit costs of the work to date on his desk every morning at 10 o'clock.

The job of placing responsibility for keeping time and measuring work accomplished is always a controversial one. Many contractors, claiming that the foreman should not be burdened with book work, employ timekeepers. Others employ young engineers who, in addition to keeping time, measure the work done at the end of a day or week and see that it is compiled and reduced to unit costs.

There are simple systems, to be taken up in later installments, which allow a contractor or a foreman to keep time and cost records. However, it should be obvious that any cost system must be selected on the basis of its being suitable for the volume and class of work being done. Foremen and other supervisors in the field should cooperate in keeping unit costs accurately. When they can see daily or weekly costs of the work—as compared to estimated costs—they will usually try to beat the costs of the previous week, and secure lower costs than other foremen on the job. If they have no part in the costing, and

no detailed personal knowledge of how the costs were obtained, they quite naturally may adopt the attitude that no matter what they do, the costs will always be too high.

(Next month's article will deal with "The Engineering Department-Simplified Deatherage cost system and the keeping of draving records.")

#### Mixermobile names agent for midwestern district

The new district representative for Mixermobile Manufacturers, Portland, Ore., for the 14 midwestern states is Wayne Hardy. With the firm, the manufacturer of the Scoopmobile front-end loader, for the past seven years, Hardy will work out of the Portland office.

## AMERICAN PILE SHOES

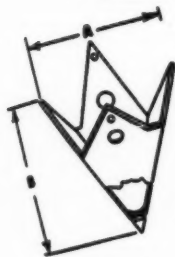
### SAVE TIME PREVENT TROUBLE on your pile driving jobs

- **EASY TO APPLY**—Nail-holes are provided for rapid, permanent application.
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- **CAN'T COME OFF**—Bending holes are provided to permit tailor-made fit. Obstructions cannot push or tear shoe from pile.



#### Dimensions - Prices

Shoe	For Piles	"A"	"B"	Weight	List Price
No. 1	6" to 9" diam.	7 $\frac{3}{4}$ "	9 $\frac{3}{4}$ "	5 $\frac{1}{2}$ lbs.	\$2.30
No. 1 $\frac{1}{2}$	8" to 11" diam.	9"	11 $\frac{1}{2}$ "	7 $\frac{1}{2}$ lbs.	2.60
No. 2	10" to 14" diam.	11"	13 $\frac{3}{4}$ "	11 $\frac{3}{4}$ lbs.	3.90



*The American Pulley Company*

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The rugged "box type" construction of the "Junior" gives you unusual strength and rigidity for such low prices. The sides are of fabricated 3/16" steel plate formed into a channel 16" deep with 2" legs. A steel belt cover completely covers the top, giving additional rigidity and completely encasing the return belt so as to prevent

material from working in to cause belt damage.

The under-slung power unit provides easy access for operation and servicing. Self-cleaning tail pulley, bar type head pulley, ball bearings throughout and heavy duty truck axles and tires are included to give it the biggest combination of fine features to be found anywhere in the low price field.

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( ) Screens ( ) Feeders ( ) Traps  
Quote size or capacity  
Name \_\_\_\_\_  
Address \_\_\_\_\_  
City \_\_\_\_\_

For more facts, use coupon, or Reader-Reply Card opposite page 18 and circle No. 277

### DEEPER, FASTER McCARTHY NEW HEAVY-DUTY VERTICAL AUGER DRILLS

POST HOLE

SOIL ANALYSIS

SHOT HOLE

DEWATERING

EXPLORATION

AUGER DIAMETER    DEPTH OF BORE

20" and 24"        16' to 30'

12" and 16"        60' to 70'

for drilling in earth, clay, compacted sand and gravel, and soft shale formations.

3", 4", 6", 8" and 9"    up to 125'

for drilling the above, plus drilling in hard sandstone formations.

Choose the most desired size auger for each drilling depth, in any vertical drilling operation. The new McCarthy Model 106-24 Vertical Auger Drill handles augers from 3" to 24" in diameter.

Adjust drilling speed properly for various rock and earth formations. Model 106-24 has two output shafts, one speed for earth and one for rock. A gear reducer slows auger rotation for harder rock formations. This gives more torque, or "biting power" in sand rock and soft limestone.



Write for Bulletin M-100

**THE SALEM TOOL CO.**  
806 SOUTH ELLSWORTH AVE.  
SALEM, OHIO, U. S. A.

For more facts, circle No. 278

The Lee tubeless tire changer operates on approximately 125 pounds of air pressure.

### Pneumatic tire changer speeds tubeless repairs

■ An air-powered tire changer for mounting and demounting tubeless truck tires is available from the Automotive Equipment Mfg. Co. Operating on approximately 125 pounds of air pressure, the Lee tire changer is capable of handling any tubeless truck tire from 17 inches to 1,100 x 24.5, on both plain rims and disk wheels, without cones or adapters.

The manufacturer claims an operator can demount a tire in 65 seconds, using only the accessory tools provided with the machine and with-



out the assistance of a crane. The machine eliminates the use of manual labor for rolling beads on or off the rim.

Occupying 40 square inches of floor

space, the tire changer need not be bolted down. Periodic greasing is said to be the only maintenance required.

For further information write to the Automotive Equipment Mfg. Co., 11000 S. Alameda St., Lynwood, Calif., or use the Request Card at page 18. Circle No. 19.

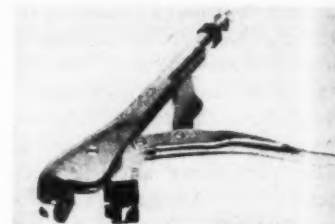
### Portable chain breaker is hand-size tool

■ BlueJet saw chain need no longer be carried to a tool bench to be broken upon an anchored jib with a punch and hammer. The BlueJet Co. has announced a portable chain breaker for use with its saw chain.

The BlueJet chain breaker is a vise-grip pliers with precision-made jaws designed to fit 1/2 and 5/8-inch-

pitch chain manufactured by the firm.

For further information write to



This new chain breaker handles BlueJet 1/2 and 5/8-inch-pitch chain.

the BlueJet Chain Co., 2704 Fourth Ave. S., Seattle, Wash., or use the Request Card at page 18. Circle No. 5.

## For Hot or Cold Patching Mixtures... In Any Season

MODEL HTD-B

### McConnaughay MULTI-PUG ASPHALT MIXER

Here's exactly what you need for quick, economical pavement repairs and small surfacing jobs... in any season... under wet or dry conditions. It's the McConnaughay HTD-B Mixer, precisely engineered and rigidly constructed to handle on-the-job mixtures of asphaltic concrete, sheet asphalt, sand asphalt or mastic asphalt... hot or cold... at remarkably high rates. It will enable you to meet all conditions with least effort and at lowest possible costs the year 'round. Write, wire or 'phone today for details and specifications.

### No Other Machine Can Do ALL These Things!

Reactivate and heat stock pile mixture—up to 10 tons per hour.

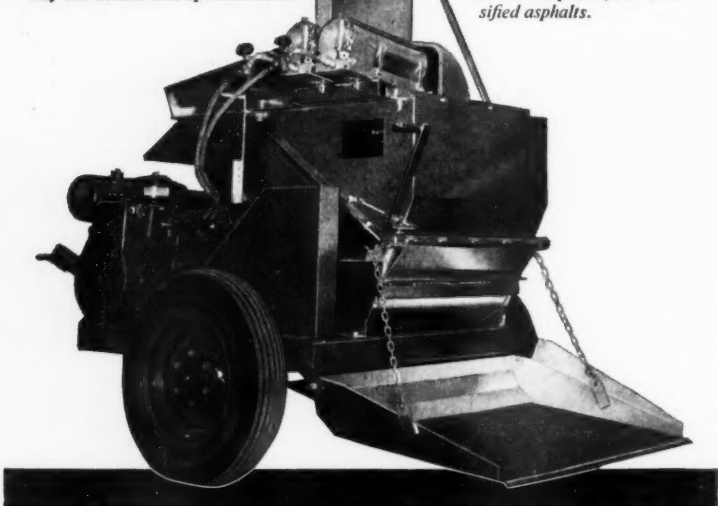
Prepare cold asphaltic mixtures—up to 10 tons per hour.

Prepare hot asphaltic mixtures—up to 5 tons per hour.

Dry various types of wet aggregates quickly, thoroughly.

Remove both moisture and solvents from bituminous mixtures.

Produce bituminous mixtures with tars, paving asphalts, cut-back asphalts, and emulsified asphalts.



**ASPHALT EQUIPMENT CO., INC.**  
3929 Buell Drive, Fort Wayne, Indiana  
National distributors for K. E. McConnaughay, Lafayette, Ind.

For more facts, use Reader-Reply Card opposite page 18 and circle No. 279

## Got A Tough Digging Job?



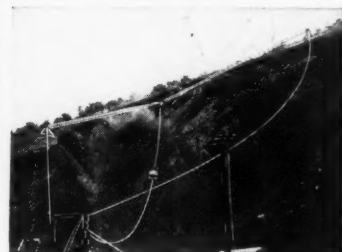
• SOFT GROUND



• DEEP WATER



• NARROW SPACE



• STEEP HILLS

## Use A Sauerman DragScraper

■ **SOFT GROUND**—Sauerman DragScrapers work on surfaces where wheeled equipment cannot go and where mats are required to operate a dragline. The DragScraper digs and hauls its load quickly at ground level to hopper or pile. It carries a payload of two to three times its weight. You are not paying the power costs of a heavy machine with a handling capacity that is just a small portion of its weight.

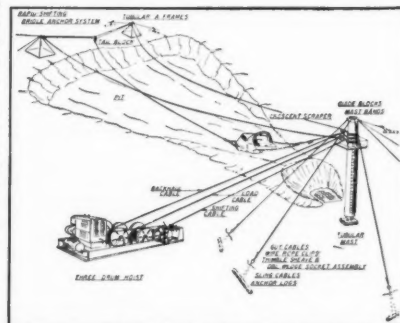
■ **NARROW SPACE**—A DragScraper can be operated through an opening no larger than the bucket's width. They are used successfully in culverts, sewers, tunnels, under bridges and buildings. Locations with limited space and head room... unworkable with other equipment... are handled efficiently and economically with a DragScraper.

■ **DEEP WATER**—A Sauerman DragScraper will dig as much as 100 ft. below water... this is far below the safe depth that a dragline bucket can go without the danger of undermining and overturning the machine. Use a DragScraper for trenching, digging channels, lakes or for beach construction.

■ **STEEP HILLS**—These are routine for a DragScraper. Material can be taken from anywhere on the bank. Digging from the top of the slope eliminates cave-ins—and the DragScraper gives an extra bonus by pushing additional material in front of the bucket on its way down the slope.

The Sauerman DragScraper operator and hoist is always located away from any hazardous area. It is designed for years of safe, continuous duty, handling bucket sizes up to 15-cu. yds. over spans to 1000 ft. or more.

When you have a "tough-to-handle" job consult Sauerman engineers about Sauerman equipment and the Sauerman Method. Request Catalog A, also the Sauerman News and field reports.



THE SAUERMAN METHOD—showing a basic DragScraper installation. Variations of this method are Sauerman engineered to handle the toughest digging jobs at the lowest cost per cu. yd. or more.

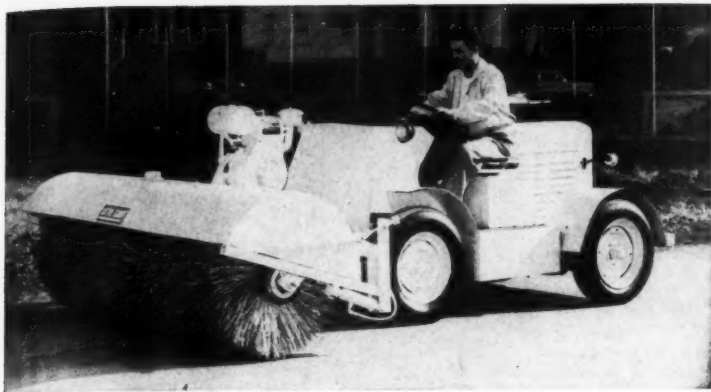
**SAUERMAN BROS., INC.** 616 SO. 28th AVE. BELLWOOD, ILL.

Crescent Scrapers • Slackline and Tautline Cableways • Duralite Blocks

For more facts, use Reader-Reply Card opposite page 18 and circle No. 280

CONTRACTORS AND ENGINEERS





### Self-propelled sweeper has 7-hp brush engine

■ What is claimed to be the first self-propelled road sweeper on the market is available from Little Giant Products, Inc. The SP-C machine is a combination of a prime mover and rotary brush assembly, each with its individual engine.

The prime mover has a 48-hp industrial engine, water-cooled and electrically started. The brush is powered by a 7-hp air-cooled engine. For heavy sweeping, the brush can be rotated fast and the prime mover shifted to a slower speed. This procedure can be reversed for light sweeping.

The SP-C prime mover has an automotive-type, easy shifting, 4-speed transmission. Rear wheel steering provides an 11-foot turning radius. Weight is concentrated on the front-drive wheels where power and traction are needed. Speeds up to 40 mph are possible.

For further information write to Little Giant Products, Inc., 1600 N. Adams, Peoria, Ill., or use the Request Card at page 18. Circle No. 41.

### Lightweight generators in ac or dc models

■ The Gen-A-Matic Corp. has added two new lightweight generators to its line of portable and standby electric plants.

The new generators weigh 78 pounds, and are available in ac and dc models, both 1,500 watts, 120 volts. Four-cycle engines, fabricated with magnesium castings, supply power for the electric plants.

For further information write to the Gen-A-Matic Corp., 14741 Bessemer St., Van Nuys, Calif., or use the Request Card at page 18. Circle No. 76.

### Air pressure sprayer

■ A folder describing the features, applications, and specifications of the Concrete Kure Kart is available from the manufacturer, McMillan Products Co. The unit is used for spraying liquid cures on floors, walls, pavements, and concrete columns. It is mounted on a pair of 12 x 400 tires and has a tank capacity of 30 gallons, according to the specification list.

To obtain this folder write to the McMillan Products Co., 2045 E. Eight Mile Road, Hazel Park, Mich., or use the Request Card at page 18. Circle No. 4.

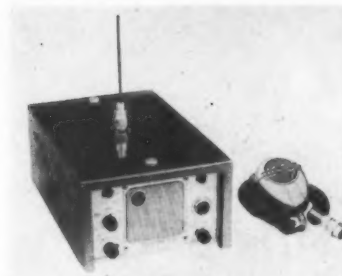
The SP-C is a combination prime mover and rotary brush assembly, each component operated by its own engine.

### Mobile radio-telephone has 1 to 5-mile range

■ A small, low-power industrial radio-telephone recommended for use on material-handling trucks is announced by the Kaar Engineering Corp. Designated the IMP (Industrial Mobile Phone) it is said to be able to perform the triple duties of base station, mobile unit, and mobile public-address system.

The IMP has a range of from 1 to 5 miles and, without any modification, can operate on 6 volts dc, 12 volts dc, or 117 volts ac. Weight is 21 pounds, and dimensions are approximately 12 x 8 x 5 inches.

The equipment is assembled in a shock-resistant mounting. All controls have been recessed.



The IMP radio-telephone operates on 6 or 12 volts dc or on 117 volts ac.

For further information write to the Kaar Engineering Corp., 2900 Middlefield Road, Palo Alto, Calif., or use the Request Card that is bound in at page 18 of this issue. Circle No. 46.

## A Super Grader for Super Jobs



IT'S "PUSH-POWER" AT THE BLADE THAT COUNTS

### The world's largest Motor Grader

WEIGHS 40,125 Lbs.

#### GALION'S T-700 GRADE-O-MATIC\* GIVES YOU TOMORROW'S PERFORMANCE NEEDS TODAY!

Its massive weight of 40,125 lbs. is balanced to permit its mighty 190 horsepower to produce tremendous "push-power" at the blade. This "push-power" at the blade means most in work production, fast cycles, and ease of operation unmatched by any other grader.

The Galion GRADE-O-MATIC\* Drive makes top grader performance practically an automatic achievement. No tiresome old-type gear shift or foot clutch to operate. Effortless power shifting can be done on the go—in either direction. Engine speed AUTOMATICALLY adjusts to working or travel speed. Up to 340% torque multiplication of engine driving force is AUTOMATIC, as needed.

\* Utilizing a Torque Converter with Tail Shaft Governor and Power-Shift Transmission.

Every part of this GALION Super-Grader is larger, heavier, stronger, more efficient. It has been engineered to give you correct balance of weight, power, and blade pressures to produce maximum "push-power" at the blade—where power means most to move more material, in quicker cycles, with less operator fatigue.

Correct balance of power and weight in the T-700 means that its 190 h.p. can be utilized without useless, costly spinning of the drive wheels—a very important point to remember when studying the work production value of a motor grader.

You'll never believe a Galion GRADE-O-MATIC Grader does so much until you own one and put it to work.



MAIL THIS COUPON FOR COMPLETE INFORMATION

THE GALION IRON WORKS & MFG. CO.  
GALION, OHIO, U.S.A.

THE GALION IRON WORKS & MFG. COMPANY  
Dept. CE-56 Galion, Ohio, U. S. A.

Please send me literature on the GRADE-O-MATIC Graders checked.

☐ Model T-700, 190 H.P. (Illustrated)  
☐ Model T-600, 140 H.P. ☐ Model T-500, 125 H.P.

PERSON \_\_\_\_\_ TITLE \_\_\_\_\_

FIRM \_\_\_\_\_

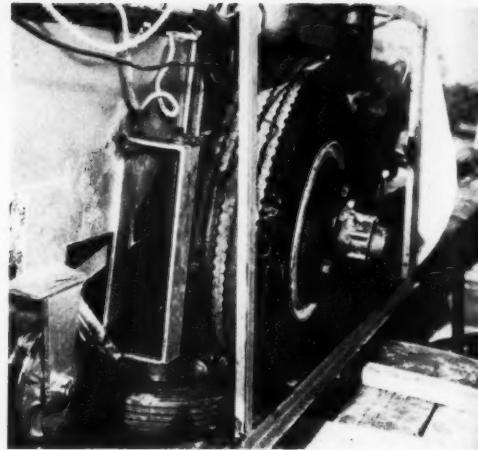
STREET \_\_\_\_\_

CITY \_\_\_\_\_ STATE \_\_\_\_\_

For more facts, use coupon, or Reader-Reply Card opposite page 18 and circle No. 281



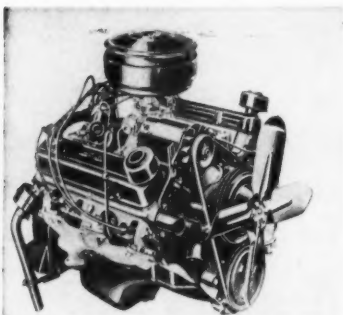
CONTRASTING with the stage-coach of a bygone era is the Skyway monorail, a 970-foot rapid-transit pilot system being operated in Houston, Texas, by a group of city businessmen and engineers to demonstrate the system's practicality, speed, and safety. The oval-shaped 50-foot coach uses 28 Good-year pneumatic tires to ride along a steel rail that is supported 18 feet above the ground by a series of inverted J-shaped towers. Eight Hi-Miler tires operate on a vertical axis to provide traction and 20 tires are horizontal, as shown above, to serve as guides while the coach is traveling.



### Horsepower increased on 1956 truck line

■ More powerful engines, tubeless tires, and several optional axle types are among the features of GMC's 1956 Blue Chip light and medium-duty truck line. In addition, 12-volt electrical systems have also been made standard equipment.

One V-8 and three 6-cylinder gasoline engines power the new trucks. The V-8, with a 316-cubic-inch displacement and a 180-hp rating, is



The 180-hp 316-cubic-inch-displacement GMC V-8 engine is available on all basic models of the GMC 1956 Blue Chip light and medium-duty truck line.

available in every basic model of the Series 100-370. In the six-cylinder power plants, a 130-hp engine is offered on the Series 100-300, a 140-hp unit on the Series 350 and 370, and a 120-hp unit on the lighter models.

The 6-cylinder engines feature 270-cubic-inch displacement. All four engines incorporate increases of from 5 to 25 horsepower over last year's models. All models utilize tubeless tires as factory-installed equipment.

Optional on standard transmission Series 300-370 models, the wide-range, one-shift axle is also teamed with all Hydra-matic transmissions in the Series 370. Its high and low ranges are spaced to permit progressive gear combinations to be obtained with a single shift of the axle, merely by flicking a lever on the steering column.

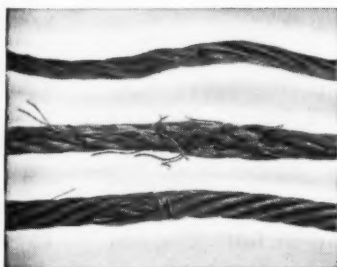
For further information write to the GMC Truck & Coach Division, General Motors Corp., 660 S. Blvd. E., Pontiac 11, Mich., or use the Request Card that is bound in at page 18. Circle No. 48.



## Tuffy® Tips



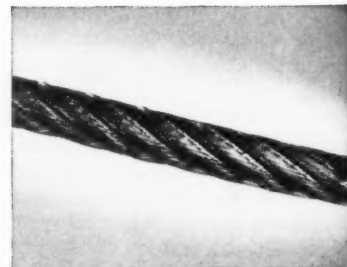
### This Is Often Where The Trouble Starts...



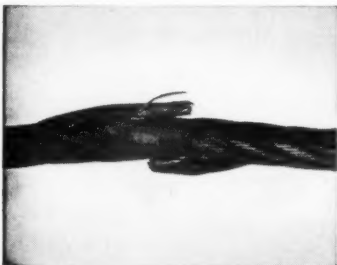
Here are three types of open kinks, all resulting from mishandling of wire rope. Guard against kinks by winding rope properly on the drum, and *never* pull a loop smaller, always enlarge it then straighten out the rope.



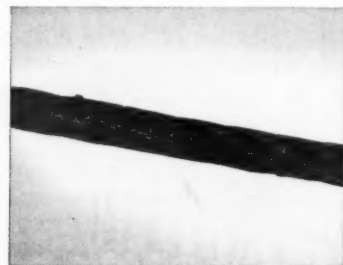
The start and finish of doglegs; the end being the point when all the wires on one side of the rope were worn through. Anything, such as a pulled loop, that causes a permanent bend or "set" will result in a dogleg.



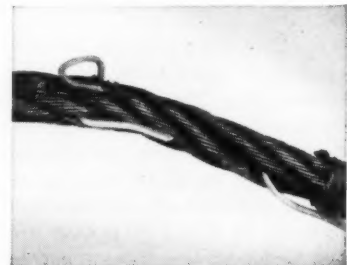
While different wire rope is constructed to resist abrasion to different degrees, improper use leads to injury. Watch for abrasion and when it begins to show locate the point where it is occurring and correct the cause.



Severe corrosive water conditions caused rust and corrosion to produce a one-strand break in this rope. Lubrication during the time the rope was in service would have retarded the damage... added greatly to the rope's life.



If broken in improperly, high strands like these may result. When installing, make sure that the fabricated relation between *strand with strand* and *strands with core* are not changed.



Nailing a wire rope through the core often causes many undesirable results. The wires and the core are badly damaged. A high strand may develop near the end or many feet away.



## Portable marking rig has 5-gallon capacity

■ A new gravity-feed marking machine, said to have triple the paint capacity of standard hand models, has been developed by the H. C. Sweet Co. Called the Florline-King, it holds 5 gallons of paint, lacquer, or whitewash, and incorporates many of the operating advantages of power machines while offering light weight, and ease of handling and storage.

The Florline-King makes lines around and between cars, machinery, and materials, with no mist hazard, no need to clear areas to be painted, or to paint in costly off-hour periods. Curved, straight, or skip lines can be made with a minimum of operator direction.



The Florline-King has a 5-gallon capacity and is convertible for working in narrow spaces.

The machine has a 6½-inch-diameter barrel and, when rear support wheels are removed, a full car-

riage width of 8 inches. It is made of heavy-gage metal with all-welded seams.

For further information write to the H. C. Sweet Co., 12345 Telegraph Road, Detroit 39, Mich., or use the Request Card at page 18. Circle No. 6.

## Thor Power Tool will move to new executive offices

Executive officers in the management and sales groups of the Thor Power Tool Co., Aurora, Ill., and sales and sales-promotion executives of the firm's divisions will move to new quarters in the Prudential Building, Chicago, at the end of the year. Officers of other departments will remain in Aurora.



The new Mall vibrator will operate off ordinary 115-volt house current.

## Motor-in-head vibrator reported easy on forms

■ The Mall Tool Co. has announced a new, motor-in-head concrete vibrator that operates off ordinary 115-volt house current and eliminates the necessity of generating equipment where house current is available. The new vibrator is designated as Model EV25.

An important claim made by the company is that the new product is easy on the forms. Vibration frequencies up to 10,000 per minute produce an effective, yet gentle result that does not damage forms. Another advantage emphasized is the vibrator's safety sealed-in switch and a thermal overload device that protects the motor-in-head from overheating.

For further information write to the Mall Tool Co., 7725 S. Chicago Ave., Chicago 19, Ill., or use the Request Card at page 18. Circle No. 81.

## Trailer tire resists sidewall checking

■ Featuring a broader, flatter, and deeper tread design, the Armstrong Mobile trailer tire is reported to permit trailers to stand idle without danger of sidewall checking. An ozone-resistant compound built into the tire provides this protection.

The manufacturer claims the tire gives heavy-duty service, maximum mileage, better traction, and greater recappability, plus low-cost-per-mile operation.

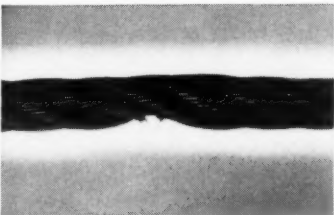
The Mobile trailer tire is available in sizes 7.00/15 6-ply, 7.00/15 8-ply, 7.50/15 8-ply and 7.50/15 10-ply.

For further information write to the Armstrong Rubber Co., West Haven, Conn., or use the Request Card at page 18. Circle No. 35.

## Goodyear appoints new southern district manager

H. F. Schweitzer has been appointed district manager at Charlotte, N. C., by the industrial products division of Goodyear Tire & Rubber Co., Akron, Ohio. With the firm since 1947, Schweitzer had formerly been a field representative in Chicago.

# Broken Rules Break More WIRE ROPE Than Capacity Loads



The photo at the left shows what happens when rope is run over or struck by a hard object and crushed. The damage to the strands greatly reduces the service life so carefully built into the rope.

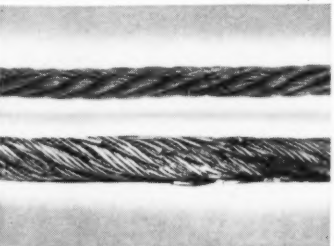
Photo at the right shows how sudden release and rebound from an over-stressed condition may often cause birdcaging. Throwing a loop into the rope is also a major cause of birdcaging. Lang Lay ropes in particular are vulnerable to this abuse.



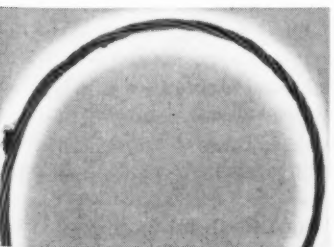
## Forget Complicated Specifications—Just say Tuffy!



Here is an example of excessive pinching in the sheave grooves. This rope lasted through only 1-½ hours of service. To prevent pinching, make sure grooves are not worn deep and that the bearing surface is sufficiently large.



Excessive drum crushing like this occurs at points of cross-over or when rope is wound unevenly. Check for even winding of each layer on the drum to prevent crushing of this type.



When a popped core occurs, continued use causes the rope lay to lengthen out considerably. This displacement of the core is usually caused by load tension being suddenly removed from the rope.



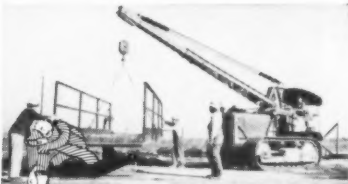
### Tuffy Scraper Rope

Mount a reel on your scraper and get full service out of every foot. Specially constructed for scraper service where complex destructive forces overwhelm ordinary rope.



### Tuffy Dragline

Flexible enough for easy casting, tough enough to give you maximum abrasive resistance and service life in handling wet or dry, hard or soft materials.



### Tuffy Slings & Hoist Line

Slings of the famous Tuffy machine braided, kink-resisting, 9-part construction, cut replacement costs. For balanced performance, team them up with Tuffy Hoist Line.



### Tuffy Dozer Rope

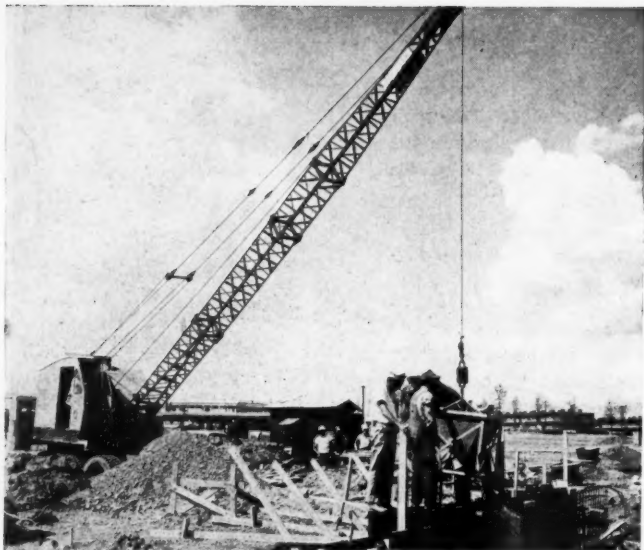
Has the stamina needed to stay on the job after ordinary ropes are thrown away. In 1 2" or 9 16" size on 150' reels for easy mounting to facilitate cut-off without waste.

## Your Tuffy Distributor: Dependable Source of Information.

His job is more than just supplying the wire rope you want—when you want it. Your Tuffy distributor is always on the alert to help make your equipment do the best possible job, at the lowest possible cost. When you have a problem that calls for special knowledge concerning your equipment that uses wire rope, give your Tuffy distributor a call. He'll be glad to furnish the help you need including factory engineers.

**union Wire Rope corp.**  
2260 Manchester Avenue Kansas City, 26, Missouri  
Specialists in high carbon wire, wire rope, braided wire fabric, stress relieved wire and strand

For more facts, use Reader-Reply Card opposite page 18 and circle No. 282



Concrete for the below-grade walls of the base theater is placed in Uni-Form panels by a Dixie Crane with Tampo 1/2-yard bucket. Transit mixers bring concrete to the pour. C&E Staff Photo

Modern brick structures, at Little Rock Air Force Base, Jacksonville, Ark., are fast transforming the waste area of an abandoned ordnance plant into a huge military facility. Late in 1953, this site was still a maze of abandoned and deteriorating roads and railroads, overgrown with weeds and brush. But the scattered ammunition-storage igloos of the World War II Arkansas Ordnance plant are now gone, and in their place is the group of structures being built for an Air Force Bomber Wing.

Less than three years ago, the initial contract for grading of the runway was awarded at the base (See "Rock Excavation Makes Airport Grading Tough", C&E, February, 1955, pg. 74). Today, most of the work has been completed on more than 70 contracts totaling well over \$32 million and involving more than 35 general contractor as well as many subcontractors and material suppliers.

The first major building contract was the award to J. H. Leveck & Son, Little Rock, for a \$2.5 million job on eight dormitories and two mess halls and administration buildings. Subsequently, a contract was awarded to G. W. L. Construction Co., Little Rock, Ark., for ten additional dormitories and two more mess halls.

A group of buildings, some in the community center and some in the operations area, are being built by Midland Constructors, Inc., Chicago, Ill. These include a special weapons training building, operational training building, airmen's club, theater, post exchange, and chapel. Many other contractors, also on the base, are working on such facilities as the base headquarters building, maintenance hangar, and other buildings, as well as on roads, streets, utilities, service facilities, and runway, taxiway, and apron paving.

#### Drilled pile footings

The structures being built by Midland Constructors, Inc., are more varied in design and construction than those built by either the Leveck or GWL firms. Several are founded

## Many contracts rush work on air base structures

on drilled pile footings that penetrate an average of 11 feet to bearing in shale or sandstone. These footings were drilled by a shop-built rig mounted on an International truck. The rig, powered by a Waukesha engine and using Williams auger bits, put down holes ranging from 12 to

24 inches in diameter. Some were belled out to as much as 52 inches at the bottom.

Ready-mix concrete supplied by Criss & Schaver, Inc., Little Rock, was poured directly from transit mixers into the pile footings. On the theater building, it was necessary to construct



for more production  
wide work range  
low job costs

# Set your sights on an HD-6B



**45 drawbar hp - 55 belt hp - 12,400 lb**  
on-the-job advantages important low

**All-steel, box-A main frame** — soaks up shock loads.

**One-piece steering clutch and final drive housing** — line-bored for true alignment of shafts and gears.

**Straddle-mounted final drives** — with bearings on both sides of gears to maintain gear tooth alignment.

**Heavy-duty truck frames** — keep tracks in line, reduce wear . . . help get more work done at lowest possible cost.

**Allis-Chalmers long-life diesel engine** — with follow-through combustion that delivers power for big output with ample power reserve.

**Simplified lubrication** — including 1,000-hour lubrication intervals for truck wheels, idlers, and support rollers . . . provides extra working time.

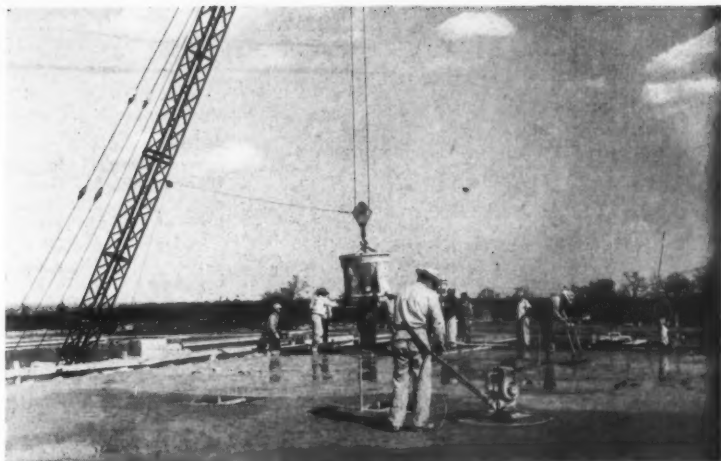


**Operations buildings, housing, and community facilities, some on drilled piles, are of brick, tile, reinforced concrete**

some below-ground walls. Excavation for this structure was done by a Dixie Crane backhoe, and the finished hand work was done with clay spades powered by a Jaeger 125-cfm compressor. Universal Uni-Form panels were used to form the walls, the Dixie Crane using a Tampo ½-yard bucket

to place concrete. All concrete was consolidated by Mall gasoline-powered mechanical vibrators. Ground floors were poured either directly by transit mixers, or by the crane and bucket method, and finished by Whiteman power trowels.

Some of the buildings in this con-



As concrete is placed in one section of the third floor of a dormitory by the Lorain, finishing is done in another section by a workman with a Whiteman power trowel.  
C&B Staff Photo



**and all these exclusive  
owners and operators:**

**Unit construction** — makes service easier, faster . . . major units can be removed without disturbing adjacent assemblies.

**Operator ease and comfort** — with foam rubber seats . . . responsive controls . . . full visibility.

**Wrap-around radiator guard** — serves as dozer lift frame . . . reduces weight and cost, produces superior balance for tractor-dozers.

**Engine-mounted bulldozers** — direct lift . . . positive down pressure . . . hydraulic straight blade or angle blade.

Plus heavy-duty, tapered roller bearing truck wheels, heavy-duty truck wheel guards, 24-volt direct electric starting, crankcase guard, bumper, and lights at no extra cost.

Check the complete service program offered by your Allis-Chalmers Construction Machinery dealer. His factory-trained servicemen, factory-approved facilities, and stocks of True Original Parts keep your equipment operating properly . . . add up to the kind of service that saves you money.

See your Allis-Chalmers Construction Machinery dealer. He will be glad to show you an HD-6B at work.

ALLIS-CHALMERS, CONSTRUCTION MACHINERY DIVISION, MILWAUKEE 1, WISCONSIN

**ALLIS-CHALMERS**



For more facts, use Reader-Reply Card opposite page 18 and circle No. 283

tract have masonry walls—similar to those of the dormitories—while others have steel columns with laminated wood roof beams, or combinations of masonry, steel, and wood. Laminated wood columns and beams, fabricated by Unit Structures, Inc., Magnolia, Ark., and carefully wrapped with protective paper as they were delivered to the site, were set in place by an American crane.

The post-exchange building, fabricated of steel, concrete, and masonry, is faced with 4×4×12 tile, cut and trimmed by a Clipper masonry saw with a diamond-edge blade. The electric motor of the saw was powered from a Miller arc-spot generator-welder powered by an Onan gasoline engine. This versatile generator was provided with an outlet to furnish the 115-volt current for lights and motors, as well as an outlet for lower voltages required for welding operations.

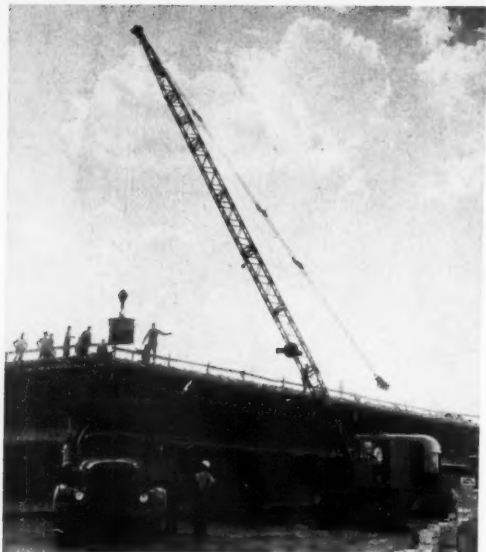
Another versatile generator—this one made by Lincoln—powered the motor of an Eveready masonry saw that cut and trimmed concrete blocks for the operational training building. Target abrasive blades were used on this saw, which was equipped with a fan and housing to remove dust chips from the saw blade.

Universal Ezebilt steel panel scaffolding supported the workmen building the masonry walls of the structure under this contract. Mortar for the masonry was mixed in three Jaeger mortar mixers.

**Cavity wall construction**

The dormitories on the base, the major part of the Leveck and G. W. L. contracts, are three-story structures 39 feet wide and 208 feet long. They have 76 rooms, each of which will be shared by three men. Two lounges and two storage rooms are provided on each floor. Gas-fired boilers and circulating hot-water systems heat the buildings, and mechanical ventilation is provided for all rooms. Each dormitory has a laundry room equipped with automatic washers and dryers.

Founded on concrete footings resting on shale, the buildings have reinforced-concrete floors with walls of load-bearing clay masonry. The typical exterior wall has a brick face on the outside and an unglazed tile in-



A Lorain MC-416 crane with 80-foot boom swings a Gar-Bro 1-yard bucket to the third-floor level of one of the dormitories being built by G.W.L. Construction Co., Oklahoma City, Okla.  
C&E Staff Photo

(Continued from preceding page)

side. These materials are separated by a 1½-inch space and tied together with metal ties. Concrete blocks are used on some interior walls. The concrete roof slabs have 2¼ inches of Fiberglas insulation and a 5-ply built-up roof.

Using ready-mix concrete, Leveck poured the footings and floors either directly from the transit mixers or with the aid of cranes and buckets. An Insley ½-yard crane with a ½-yard concrete bucket and a Northwest crane with a 1¼-yard bucket raised the concrete to the second and third-story floors. Buggies assisted the cranes in placing concrete for the roofs of the buildings. Focer Vibro-Plus gasoline-powered vibrators helped consolidate the concrete.

Forms for the floor and roof slabs

were made of ¾-inch plywood panels supported on 4×4 and 4×6 joists. Acrow adjustable steel shores, on the slab below, supported the joists.

#### Conveyors deliver brick, tile

As soon as a floor slab was completed, a Sam Mulkey Co. conveyor was set up to raise the brick and tile from stockpiles on the ground to the finished floor, so that workmen could build the masonry walls of the next story. As the walls rose, Patent scaffolding was set up for the masons, and the conveyors were adjusted to deliver the materials directly to the scaffolds.

Odd shapes and sizes of tile were cut on the job by four Champion masonry saws using diamond-edged blades. Mortar for the masonry was mixed in several Essick mortar mixers. Steel door frames were attached to the concrete floors with steel studs driven by a Ramset 22-caliber powder-actuated tool.

Since the second group of dormitories, built by G. W. L. Construction Co., were similar to the first, there were many similarities in the operations of both firms. This contractor used two Schield Bantam backhoes to dig the foundation trenches an average of 8 feet to the underlying shale. The 16-inch buckets of the Bantams dug neatly and accurately enough so that concrete could be poured directly into the trenches without the use of forming.

From its own Johnson concrete batching plant on the site, G. W. L. delivered concrete to the jobs in a fleet of transit mixers. The Jaeger, Smith, and Rex units were mounted on GMC and International trucks. Concrete for the footings and for the first floor slab was placed directly from these mixers. Concrete for the second and third floors and roof was hoisted in Gar-Bro 1-yard buckets by Lorain MC-254 and MC-416 cranes. The latter had an 80-foot boom, enabling it to reach all concrete pours, including those for the roof.

All of the concrete slabs—for second and third floors as well as ground floors—were finished by two White-man power trowels. As the concrete was placed, it was consolidated with the aid of Mall electric vibrators. After finishing, the floors were covered with Lyman Lamb paper for curing and protection.

G. W. L. used Acrow adjustable steel shores to support the floor and roof forms, Patent scaffolding for the men building the masonry walls, and Mulkey conveyors to raise the tile and brick from the ground to the workmen on the scaffolds. One Champion and three Clipper masonry saws were used to cut the tile.

Leveck started work on the initial building contract in June, 1954. G. W. L. got the work under way that September. Both these contractors completed work early this year. Midland's job should be substantially completed by late spring, though other construction on the base will still be in progress.

Buildings going up at the base are grouped into operational and community center groups. Dormitories,

With more reserve power (GM Diesel Model 4-71)  
at 100 rpm slower speed (1700 instead of 1800 rpm)  
it delivers 50 cfm more air (365 instead of 315 cfm)



## THE JAEGER "365" ROTO AIR-PLUS®

first fully efficient rotary compressor in the ideal size for gunite work, heavy duty sand blasting or operating, simultaneously, a 4" wagon drill and hand-held rock drill.

For full information on Jaeger high efficiency rotary compressors, 125 to 600 cfm sizes, see your Jaeger distributor or send for Catalog JCR5.

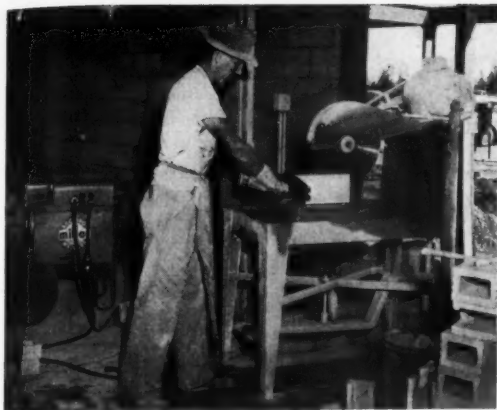
### THE JAEGER MACHINE COMPANY

701 Dublin Avenue, Columbus 16, Ohio

PUMPS • CONCRETE MIXERS • TRUCK MIXERS • SPREADERS • FINISHERS • LOADERS  
For more facts, use Reader-Reply Card opposite page 18 and circle No. 284

CONTRACTORS AND ENGINEERS





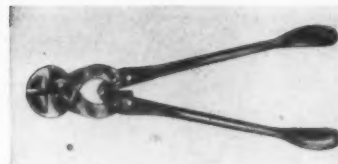
A workman cuts tile for the interior wall of the post-exchange structure with a Clipper masonry saw. Power is supplied by a Miller arc-spot welder generator, which can also provide power for lighting, equipment, and welding.

C&E Staff Photo

## Two bolts change range of new utility cutter

■ A dual-range utility cutter with two jaw-capacity ranges has been developed by the Champion DeArment Tool Co. The jaw capacity on the No. 99 utility cutter is increased from the narrower to the wider range by moving two bolts.

The new cutter is drop-forged from high-grade special-analysis steel with induction-hardened cutting edges. It is a diagonal cutter so that the handles are conveniently raised above



work level for hand clearance. The over-all length of the cutter is 16 3/4 inches.

For further information write to the Champion DeArment Tool Co., Meadville, Pa., or use the Request Card at page 18. Circle No. 78.

mess halls, theater, and chapel, are included in the community center. Buildings for military or operational functions are being located in a group convenient to the aircraft facilities. Additional housing units for families are being constructed in an area near the community center.

This arrangement of the buildings takes advantage of the rolling topography of the site, and the conservative and simple architecture makes for an unusually attractive over-all appearance of the base, which will be enhanced when roads, walks, and landscaping are complete.

### Personnel

All planning and construction at the base are under the supervision of the Little Rock District, U. S. Army Corps of Engineers. Representing the District on the project are A. G. Carlson, project engineer; W. C. VanMeter, assistant project engineer, and T. S. Cook, field engineer. The district engineer of the Little Rock District is Col. Staunton L. Brown.

General manager for J. H. Leveck & Son was Roy C. Bridges. Others on the staff included project manager Gary E. Bridges, general superintendent S. B. Paxton, and masonry superintendent Jack McGlothlin. The project manager and general superintendent for G. W. L. Construction Co. was Jack Austin, and he was assisted by William A. Hickey, assistant superintendent, and George B. Spencer, masonry superintendent. Midland Constructors, Inc., has J. D. Hart as project manager. C. L. Harper is superintendent, and N. D. Purtle, assistant superintendent.

THE END

### Truck mixer; drive

■ Two catalogs from Cook Bros. Equipment Co. feature the Challenge Pacemaker truck mixer and the Challenge engine-takeoff drive. Various Pacemaker models with mixer capacities of from 3 to 8 cubic yards are pictured. The engine-takeoff drive is diagrammed, and the single-lever operation which stops, starts, reverses, and regulates the speed of the mixer drum is explained. The literature also states that this drive assures a two-speed operation on diesel, high-speed gasoline, or lpg engines.

To obtain these catalogs write to Cook Bros. Equipment Co., 3334 San Fernando Road, Los Angeles 65, Calif., or use the Request Card at page 18. Circle No. 89.



John A. Denie's Sons' ready-mix concrete plant, located at Memphis, Tennessee, showing part of their fleet of Macks, which now totals 60 and is still growing.

John A. Denie's Sons Company, Memphis, Tennessee, reports:

## "To assure on-time service customers request delivery by MACKS"

Four years ago, the John A. Denie's Sons Company, one of the largest and oldest ready-mix concrete plants in the country, recognized their need for the most dependable, heavy-duty truck chassis available. Their problem was one of making ready-mix deliveries on time to almost inaccessible locations over extremely rough terrain. To solve it, Denie's tried just about every make of equipment. Finally, they purchased four Mack six-wheelers.

"Shortly after our Macks went into operation, customers started to call and request that their orders be delivered by Macks. They knew they could depend on them to make delivery on schedule, regardless of the rugged ground over which they had to travel. Our records show that no Mack has ever failed to deliver a load on time," writes Mr. Forrest Ladd, Denie's executive vice president.

After noting the widespread customer satisfaction with their reliable service, and a thorough check of their operating costs, Denie's president, Mr. M. A. Moss began to increase their fleet of Macks. Today

they have 60 Macks, and the number is still growing.

"Another interesting fact revealed by our operating reports," states Mr. H. O. Pommer, vice president in charge of operations, "is that Denie's has never had to replace an axle shaft, driveline, ring gear, pinion, brake drum, or reline any of the brakes on any of its Macks."

Denie's executives, like so many others, know from experience how well their investment in Macks has paid off for their company.

Let your Mack Branch or Distributor give you complete details... find out how Macks can improve your hauling operations. Mack Trucks, Empire State Building, New York 1, N. Y.

**MACK**  
first name for  
**TRUCKS**

For more facts, use Reader-Reply Card opposite page 18 and circle No. 285



The new LeTourneau-Westinghouse Fullpak scraper has a 12 per cent greater heaped capacity than its predecessor while maintaining the same 12.2-yard struck capacity.

## New 18-cubic-yard scraper is lower, wider, yet has more ground clearance

■ A new 18-cubic-yard scraper, built wider and lower than its predecessor but said to have more ground clearance, has been announced by LeTourneau-Westinghouse. Designated the Model C Fullpak, the new unit is said to have a heaped capacity 12 per cent over that of the old model, while retaining the same 12.2-yard struck capacity.

The lower center of gravity on the Fullpak minimizes rocking and contributes to the scraper's stability. It is claimed to be virtually tip-proof even when working on steep slopes.

Air brakes and fingertip-controlled electric motors, located to minimize cable lengths, allow extra-safe, non-fatiguing operation, according to the manufacturer.

A pair of screened windows in the upper portion of the apron aid in giving the operator a clear, continuous view of his blade. Visibility is also helped through the design of the new gooseneck yoke, which drops the tube and side-arm assembly of the scraper low behind the prime mover.

A quick-drop mechanism on the bowl lift is standard equipment on the Fullpak. It permits the operator to "pump" tough-to-load loose materials, thereby increasing efficiency. An extra-low push block, built to match the height of the push plate on the most generally used tractors, is utilized. The center of the block is 3 feet from the ground.

Scraper load speed has been matched with pusher speeds. When the scraper's engine is turning at its full-rated working rpm (2,000), first gear with sliding gear transmission provides a speed of 2.9 mph. Low range with constant mesh torque-converter transmission at the same rpm gives 2.2 mph. Closely matching tractor speeds, these rates team the scraper to the pusher and contribute to the elimination of alternate over-lugging and scraper walkaway, the company reports.

In addition to the low loading speed, the transmission options on the Fullpak provide complete speed ranges with top speeds as high as 30 mph. Prime mover engine options are the GM 6-71 208-hp, a 2-cycle 6-cylinder unit, or the Cummins HBIS-600, a 4-cycle 6-cylinder model.

For further information write to the LeTourneau-Westinghouse Co., 2301 N. Adams, St., Peoria, Ill., or use the Request Card at page 18. Circle No. 73.

## Announce cross-bridging made of ribbed steel

■ The F. D. Kees Mfg. Co. has announced a new Stur-D ribbed-steel cross-bridging for floor joists said to be stronger than wood bridging and neater in appearance. It is recommended for use in new installations or for strengthening the floors in existing buildings. It may also be used as a bracing for studding.

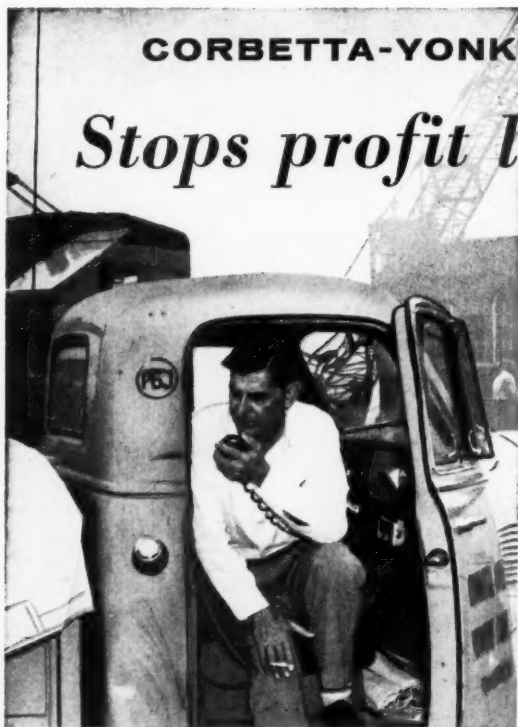
The cross-bridging, which arrives on the job site ready for use, is made of 16-gage heavily galvanized rust-resistant V-ribbed steel. The ends are flat, with five nail holes in each for variable fit-ups.

The 20-inch lengths can be used with 2x8's, 3x8's, 2x10's, 3x10's, 2x6's, and 3x12's; the 17-inch lengths can be used with 2x8's, 3x8's, and 3x10's.

For further information write to the F. D. Kees Mfg. Co., Beatrice, Neb., or use the Request Card at page 18. Circle No. 105.

## CORBETTA-YONKERS JOINT VENTURE

# *Stops profit leaks with radio*



A Superintendent Should be Everywhere to answer questions and solve problems, but having 2-way radio is the next best thing.



It Costs Money to have a Bulldozer Idle! These mechanics arrived minutes after the breakdown because they were called by radio.

When you've bid on and received the contract for a construction project, every dollar you save goes towards profits. That's why the joint venture of Corbetta Construction Co., New York City, and the Yonkers Contracting Co., Yonkers, N.Y., on a three-mile stretch of the New York Thruway, depends so much on its Motorola 2-way radio system.

With about 450 men on the job, using approximately 250 pieces of major equipment to build 8 bridges and miles of retaining walls, as well as the main highway, there are many opportunities to save money with radio.

For example: when a truck, dozer, loader, drag line or shovel breaks down, every minute of delay in getting a crew to fix it costs money for machine and operator, and delays the project. But, with Motorola 2-way radio, it takes only seconds for a superintendent to contact a mechanic and have help on the way.

Or, if lack of a compressor is holding up an important job, it takes just a few minutes to contact everyone using compressors and find out who can spare one. There may be a question about the location of a utility line. Are the utilities superintendent's drawings up to date? There's no danger of a major mistake when he can pick up his microphone and call field headquarters for the answer.

Planning the next day's work is fast and easy. Just hold a conference over the Motorola radio and save hours of expensive supervisory time. Or when you are pouring concrete. Where is it needed? How much more is wanted? No difficulty getting the answers via radio... one man can take care of it.



160 Calls per Day reports the base station dispatcher.

Just a few of the ways in which Corbetta Yonkers cuts costs, increases profits with Motorola 2-way radio. Learn how you, too, can increase profits on your next job. Write, phone or wire: Motorola Communications & Electronics, Inc., Construction Department.

# MOTOROLA

## 2-WAY RADIO

MOTOROLA COMMUNICATIONS & ELECTRONICS, INC.  
A SUBSIDIARY OF MOTOROLA, INC.  
4501 AUGUSTA BOULEVARD • CHICAGO 31, ILLINOIS  
ROGERS MAJESTIC ELECTRONICS LTD. TORONTO, CANADA



Motorola consistently supplies more mobile and portable radio than all others combined.  
Proof of acceptance, experience and quality.  
The only COMPLETE radio communications service—specialized engineering...product...customer service...parts...installation...maintenance...finance...lease.  
"The best costs you less—specify Motorola."

For more facts, use Reader-Reply Card opposite page 18 and circle No. 286

CONTRACTORS AND ENGINEERS





### Dial-calibrated level is handy pocket tool

■ A dial-calibrated level that will measure degrees of level or plumb and also inch rise per foot is offered by Pickett Products, Inc. The Devil level utilizes the semifloating needle principle.

The pocket instrument measures verticals, horizontals, all angles, slopes and pitches. The machined bob registers instantly, yet the viscosity of the liquid plastic holds the bob steady for accurate reading.

The Devil level measures 2x2x1 inches. It is shock-resistant and unaffected by temperatures as low as minus 60 degrees F.

For further information write to Pickett Products, Inc., 1111 S. Fremont Ave., Alhambra, Calif., or use the Request Card at page 18. Circle No. 23.

### High-strength bolts

■ A booklet on high-strength structural bolts for buildings, airplane hangars, industrial plants, and bridges is available from the Russell, Burdsall & Ward Bolt & Nut Co. Said to be a guide for joining structural steel members, the booklet explains the theory of bolting, hand and power wrenching, installation data on calibrating impact wrenches, the advantages of high-strength bolting, and air supply and inspection techniques. Also included are tables of recommended torque, and the length of structural bolts as compared to grip and rivet length. The company's method of manufacturing the bolts is described.

To obtain Bulletin HS-1 write to Russell, Burdsall & Ward Bolt & Nut Co., 100 Midland Ave., Port Chester, N. Y., or use the Request Card at page 18. Circle No. 59.

### Aggregate dryer

■ A dryer for sand, stone, and gravel is described in a folder from Tarrant Mfg. Co. A diagrammatic picture of the portable Tarco Flash Flame dryer points out the swivel-mounted kerosene burner, combustion chamber, the 20-inch-diameter discharge, heavy-gauge steel drying drum, automatic fuel pump and fuel-pressure gage, four-cycle air-cooled engine, and built-in fuel tank. The advantages and operations of the unit are detailed.

To obtain Form 955 write to Tarrant Mfg. Co., 27-29 Jumel St., Saratoga Springs, N. Y., or use the Request Card at page 18. Circle No. 62.

GROUT IS POURED OVER POSTONWAY CERAMIC BLOCKS during construction of a runway test strip at the U. S. Marine Corps auxiliary landing field in Wilmington, N. C. This strip was constructed of 8-inch square blocks, 4 inches thick, on a 1-inch base of sand and lime, with a subbase 4 inches thick in one section and 8 inches thick in another. Another strip used the base course directly over subgrade. The pavement was reinforced with deformed steel bars. Plate load tests indicated safe maximum tire loads well in excess of the Navy's rigid requirements of 50,000 pounds per wheel, even when no subbase was used. Exposure tests reportedly showed the Postonway pavement could stand up under the terrific heat and punishment of modern jet aircraft better than conventional runway surfaces. For more details write to the Poston Brick & Concrete Products Co., 2600 S. Grand Ave., Springfield, Ill., or use the Request Card at page 18. Circle No. 121.



## here's a Wagon Drill that really gets around!

### the G-800 TracdriL

- Self-Propelled
- One-man Operated
- Tows Own Compressor

Combine the drilling speed of the hard-hitting CP-70NDC Drifter with the adaptability of a CP Drill Carriage and U-arm... add the maneuverability of a self-propelled track-mounting that tows its own air supply over rough terrain... and you have the One-Man CP TracdriL.

Reversible tramming motors enable the TracdriL to go forward, backward and pivot

... for faster "moving time" from hole-to-hole, more accurate spotting and more time for productive drilling. "Knee-action" tracks keep the hydraulically operated U-arm support level when operating on uneven ground. The TracdriL has plenty of reserve power... can tow a 13,000 pound CP 900 c.f.m. Rotary Compressor up a 10% grade. For details see your CP equipment distributor.



## Chicago Pneumatic

8 East 44th Street, New York 17, N. Y.

PNEUMATIC TOOLS • AIR COMPRESSORS • ELECTRIC TOOLS • DIESEL ENGINES • ROCK DRILLS • HYDRAULIC TOOLS • VACUUM PUMPS • AVIATION ACCESSORIES

For more facts, use Reader-Reply Card opposite page 18 and circle No. 287

# Leapfrogging wellpoints dewater four miles of pipeline trench

**Sections disconnected from one end are tied into the other; system keeps operating continuously while 66-inch line is laid**



Wellpoints are installed along the right-of-way, a crane raising and lowering the points as water is forced through them to jet the pipe into place. In the foreground, a workman connects the Stang wellpoints to the header with metal-reinforced hose.

*C&E Staff Photos*

section mean that approximately 100 wellpoints had to be set and a corresponding number removed from the completed area. After points had been set and connected, it was necessary to pump the ground-water level down, dig the trench, and lay the pipe. The Stang system used by Eby consisted of about 500 wellpoints, some 1,500 feet of 8-inch header, three 10-inch pumps, and 10-inch discharge lines. The 1½-inch points,

measuring 3 feet in length, were attached to 14-foot lengths of 1½-inch pipe, making an over-all length of 17 feet. The points were set at 3-foot intervals and connected to the pipe header by short lengths of metal-reinforced rubber hose.

An installation was started when a jetting hose was connected from a 4-inch Gorman-Rupp jetting pump powered by a Chrysler engine to the riser pipe of a point. The jetting

The 4 miles of 66-inch concrete pipeline that had to be laid 5 feet below ground-water level represented the toughest stretch in the 20-mile line that will be completed between Wichita, Kans., and a water-producing area northwest of the city this summer. But Eby Construction Co., Inc., Wichita, the general contractor for the pipe-laying work on this \$8 million project, got through this difficult stretch by using a wellpoint system that could be moved steadily ahead as pipe sections were laid, and which never stopped pumping.

Using three pumps and a series of valves, the Stang wellpoint system was kept in continuous operation while wellpoints and sections of header were leapfrogged over those in operation and set in new positions. Although progress was painfully slow compared to that in dry ground, the crew moved along steadily, laying from 5 to 35 of the 16-foot-long Lock Joint pipe sections per day.

Water presents no problem for most of the big line, which extends from wells in a water-bearing area in Harvey County, near Halstead, southeasterly to the Wichita municipal water plant. In dry areas, the pipe-laying crew moved fast, a big Northwest 80D dragline with 3-yard Hendrix bucket scooping out the trench as a Manitowoc 3000B crane set the 13-ton sections in place in the trench. As the pipes were seated and the joints sealed, a Caterpillar D8 tractor-digger backfilled the trench. Under these favorable conditions, as much as 800 linear feet of line was laid per 10-hour day.

## Wellpointing required

But the pipeline, planned and being supervised for the Wichita Water Department by Black & Veatch, consulting engineering firm of Kansas City, Mo., has some difficult stretches. The alignment includes four waterway crossings—one a drainage canal crossing, the other three crossings of the winding Arkansas River. In the 4-mile section having 5 feet of ground water, only an average of about 20 of the 16-foot lengths of pipe were placed per day.

Even this slow rate—around 320 feet per day—was remarkably fast, considering job conditions. The average of 320 feet placed daily in this



"The performance of this machine speaks for itself," says Sidney Steel, paving superintendent of the Austin Paving Co. "Our records tell us this machine has long since paid for itself and it still has years of work left in it."

**Austin Paving Company of Dallas, Texas put down 5,580 sq. yards of concrete in one day with single Flex-Plane Finisher!**



Speed, power and flexibility, designed into the Flex-Plane, enabled it to easily keep pace with a dual drum paver while making two passes over the roadway, without benefit of a spreader.

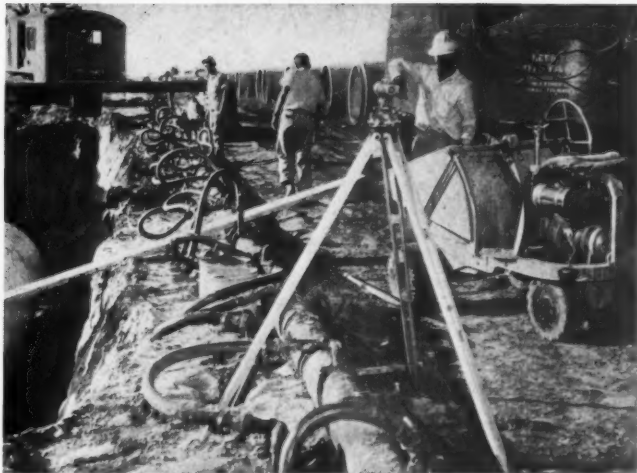


**WORLD'S LARGEST BUILDER OF CONCRETE FINISHING EQUIPMENT**





Whiteman power buggy picks up a load of grout for the pipeline joints from a Kwik-Mix Dandie mixer.



A workman uses a pail to transfer grout from the Whiteman buggy to the funnel inserted into the runner around the pipe. When the joint is completed, the line will be backfilled.

# Paving Record for... *Flex-plane*

● A Flex-Plane Portable Finishing Machine recently spread and finished 1860 lineal feet of 27-foot width street, with 6" integral curbs on both sides, in a single day for the Austin Paving Company of Dallas, Texas.

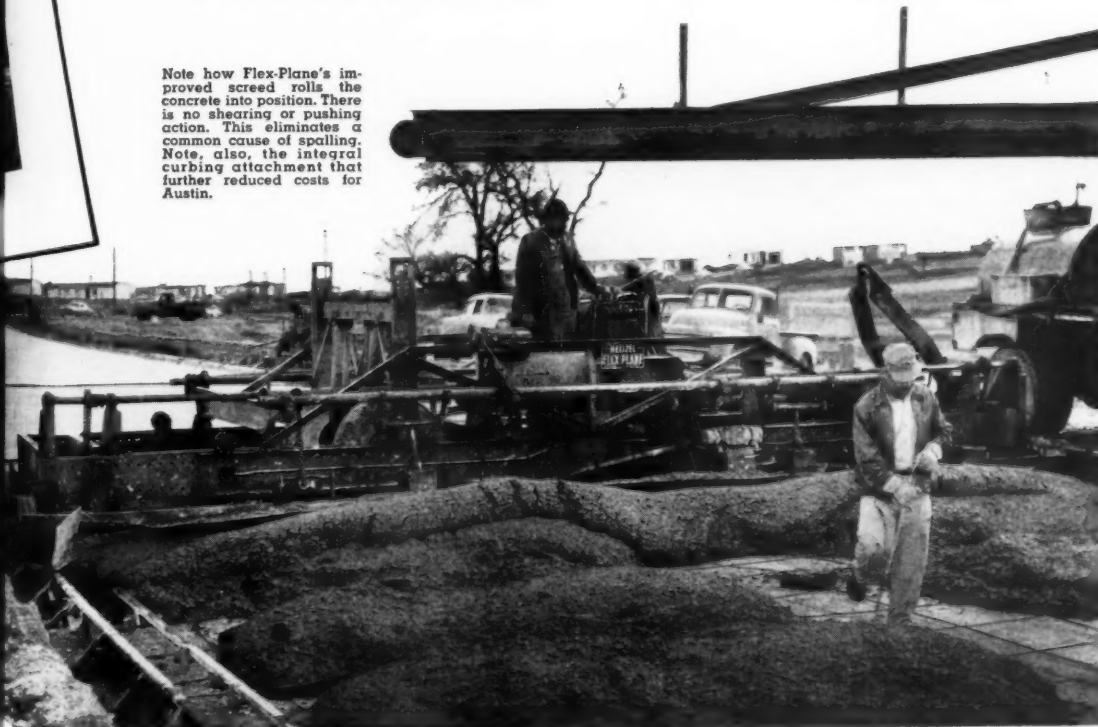
"Taking the concrete as it came from a single dual-drum paver, the Flex-Plane machine spread and finished it to a degree that required a minimum of hand finishing. It's a great piece of equipment!" says Sidney Steel, Paving Superintendent for Austin.

The Austin machine was equipped with integral curb attachments on both sides, and according to Steel, this feature alone saved them many pouring hours.

It's this kind of performance that has made the Flex-Plane, the industry's fastest selling and most desired finishing machine. Why not let our sales-engineers put you in touch with a Flex-Plane user in your area. His story will convince you that, if you do any roadway or runway paving at all, you can't afford to be without a Flex-Plane.

**THE FLEXIBLE ROAD JOINT MACHINE COMPANY**  
7100 THOMAS ROAD WARREN, OHIO

Note how Flex-Plane's improved screed rolls the concrete into position. There is no shearing or pushing action. This eliminates a common cause of spalling. Note, also, the integral curbing attachment that further reduced costs for Austin.



For more facts, use Reader-Reply Card opposite page 18 and circle No. 288

pump drafted water from a nearby ditch, forcing it out through the well-point. A Northwest 25 crane picked up the point and gradually lowered it into place, workmen keeping at the proper angle as the water jet dug into the ground. It was often necessary to raise and lower the points several times before they worked their way down to full depth.

The points were set on a line about 10 feet from the center line of the trench. The pipes were sloped at an angle of about 60 degrees, the horizontal pointing toward the center of the trench. Thus when the points were in place, they were near the center line of the trench, though the risers and header were far enough to the side to be out of the way of the excavating and pipe-laying equipment.

## Valves control pumping

As new sections of header were placed, valves were inserted at regular spacings. When one of the pumps was moved ahead, valves were installed in the header on each side of the pump. As soon as a pump had been set and connected to the header, it started pumping from the section behind. Meanwhile, additional lengths of header were being extended along the line. Then as the next section of header was installed and valved off at the far end, the valve adjacent to the pump was opened so that the pump was able to work on this section. A pump was usually moved about 1,500 feet ahead in one jump. It remained in that position while the excavating and pipe-laying crews moved as much as 3,000 feet ahead.

Since three pumps were used, it was always possible to keep at least two on the lines while the third was being moved to a new location. All of the pumps were Stang wellpoint pumps, converted from Gorman-Rupp basic pumps, and they were powered by Hercules engines that used butane for fuel. The butane tanks, carried on skids right with the pumps, were filled in the field by a bulk service truck. The 10-inch discharge lines of the pumps were run to the nearest natural drainage channel so that water was led away from the trench.

As soon as the water was drawn about one foot below the level to be



## "BERG" CONCRETE SURFACERS

FOR BRIDGES, DAMS, CULVERTS, HIGHWAYS, FLOORS, WALLS, AIRPORT RUNWAYS, AND OTHER APPLICATIONS

Portable Model A

Models H-8 and H-10



## "BERG" for Quality Work at Low Cost

**MODEL A.** Lightweight, electric powered unit . . . suspends from operator's shoulder. Interchangeable heads and attachments for surfacing concrete buildings, bridges, dams, walls, culverts, etc. **MODELS H-8 and H-10.** One-man gasoline engine powered units for surfacing concrete highways, streets, floors, airport runways. Includes exclusive power take-off for attaching "BERG" flexible shaft equipment for surfacing bridges, walls, etc. Write today for descriptive literature on machines and attachments.

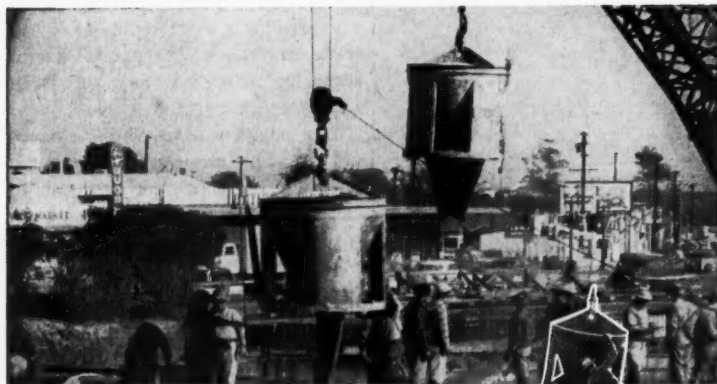
**THE CONCRETE SURFACING MACHINERY COMPANY**

4665-69 Spring Grove Ave., Cincinnati 32, Ohio

For more facts, use Reader-Reply Card opposite page 18 and circle No. 289

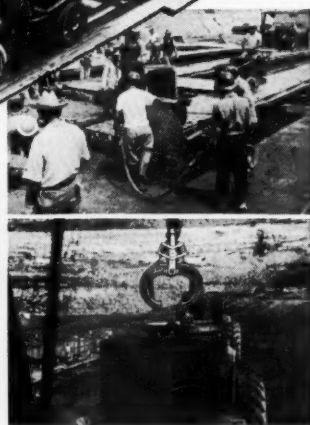
## Use Production Line Methods

FOR HANDLING CONCRETE



**SETTING A FASTER PACE** by using two or more concrete buckets is a method for cutting costs used by many contractors on medium size jobs. While one is discharging the other is loading—there is no delay of placing crew or mixers.

**FLOOR HOPPERS** keep concrete carts moving by serving as storage for concrete. Fill them direct from truck mixer or by bucket if in elevated position.



**POWER-CARTS**, because they carry more, travel faster and are non-fatiguing, can place 4 to 5 times as much concrete per hour as a push cart even at hauling distances of 1000 feet.

**PORTABLE HOPPERS** move from job to job easily and save hours of time all the way down the line from mixer to placing crew to finishers because it eliminates waiting time and delay.

New power operated **CRANE HOOKS** are electrically controlled from the crane cab. They are ideal for picking up and releasing each individual bucket when several buckets are used.

**GAR-BRO MANUFACTURING CO.** • Los Angeles, California • Peoria, Illinois  
General Offices: 2415 East Washington Boulevard, Los Angeles 21, California

# GAR-BRO

Ask your dealer for the Gar-Bro Manual...

the world's most complete line of  
**CONCRETE HANDLING EQUIPMENT**

For more facts, use Reader-Reply Card opposite page 18 and circle No. 290



A 16-foot section of the 66-inch Lock Joint pipe is laid in the dry trench by a Manitowoc 3000B crane. The wellpoint pump, left, basically a Gorman-Rupp converted for wellpoint use by Stang, is powered by a Hercules engine.

C&E Staff Photo

(Continued from preceding page)

reached by the bottom of the pipe, the Northwest 80D dragline dug the trench to a depth of about 10 feet in the sandy material. A Manitowoc 3000B crane, using a heavy cable sling, then picked up the 16-foot lengths of Lock Joint pipe and lowered them into place in the trench.

To seat the pipes tightly together, the contractor used a 5-ton hand winch, anchored in a joint in the pipeline and having a cable that extended to the end of the line. The cable was attached to each new section laid, so that the winch was able to draw the new pipe length into place.

The tongue-and-groove joints of the pipe were fitted with Lock Joint rubber gaskets to make a watertight connection, and the annular space outside the gasket was filled with cement grout. The grout was mixed in a Kwik-Mix Dandie mixer set up at a convenient spot beside the right-of-way. A Whiteman power buggy picked up the grout from the mixer and hauled it to the joints. A pail and funnel was used to pour the grout into the top of a runner placed around the outside of the joint. When the grout had set, a Caterpillar D8 tractor-digger pushed the sand into the trench to cover the line. When backfilling had been done, this machine cleared up the right-of-way.

## Better Welding

anywhere-any time  
with these gas drive  
**HOBART welders**

**Hobart "Husky Boy"** opens up new welding opportunities. You can put it on any job quickly, anywhere, any time—without depending on electric power lines.

GET ON-THE-JOB WELDING AT LOW COST . . . Dependable service, low operating cost and a minimum of maintenance and repair make these three Hobart Welders the choice of operators everywhere—we have hundreds of testimonials from contractors to prove it!

Besides outstanding performance, you get these convenience features: Dual Control, Auxiliary Power for operating lights, tools, pumps, etc., away from power lines, and a choice of portable mountings.

For complete information on these Hobart Arc Welders, fill out the coupon below and mail it today—no obligation.

**HOBART TROY OHIO WELDERS**

HOBART BROTHERS CO., Box 856, Troy, Ohio, Phone 21223

Without obligation, please send information on items checked...

☐ "Husky Boy" ☐ Contractor Sp. ☐ Water Cooled AC-AC

☐ Free Electrode Samples for

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**CONTRACTOR SPECIAL** . . . especially designed to meet the needs of pipe line welding. Compact, lightweight, with a hot, fast, dependable arc.



**WATER COOLED AC POWER** . . . a dual purpose welder that can be used for operating electrical equipment, or for AC welding independent of power lines.

For more facts, use coupon, or Reader-Reply Card opposite page 18 and circle No. 291

CONTRACTORS AND ENGINEERS





When not busy laying pipe sections, the Manitowoc pulls wellpoints no longer in use and loads them onto a truck for transfer to the front end of the line. Header sections are dragged to the new site by a Caterpillar D8.

When it was not busy laying pipe, the Manitowoc 3000B crane moved back along the right-of-way to pull the wellpoints along completed sections of the line. Hoses were disconnected from the header, and the wellpoints were pulled straight up to keep them from being bent or damaged. Then the points were loaded on a truck, moved ahead, and reset as rapidly as possible.

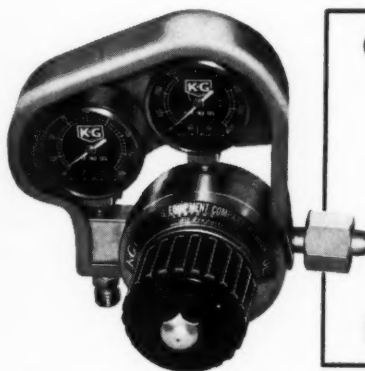
When the points were being pulled from a section of header pipe, the section was disconnected from the rest of the header at a valve so that the remainder of the system was able to remain operative. The Caterpillar D8 tractor hooked onto the header section not in operation and dragged

it ahead to a new position alongside the trench. In this way, 100 to 150-foot-long sections were leapfrogged as a unit and individual lengths of pipe did not have to be disconnected. The pumps and fuel tanks were mounted on skids which the tractor also moved to a new position.

#### Trucks haul pipe

The 20 miles of concrete-encased steel pipe were fabricated by the Lock Joint Pipe Co., East Orange, N. J., at a plant located at Colwich, Kans. Pipe was hauled from the plant to the job by six trucks, four of them Whites, and two, Internationals. Each truck hauled just one of the 16-foot

(Concluded on next page)



On **YOUR** job, be on guard  
against breakage  
and wear

use **K-G**  
"On Guard"  
**REGULATORS**

The new K-G "On Guard" Regulator is built to stand up under the roughest kind of field service. In every detail it is so designed that the need for repairs—inside and out—is virtually eliminated! The GAUGE GUARD, with spring lock action, protects delicate gauges from accidental breakage due to impact from falls and collisions. The STAINLESS STEEL INLET can stand the shock of cylinder upset without damage. The ADJUSTING SCREW, of tough stainless steel with adjusting mechanism completely

enclosed in the bonnet, is almost indestructible. The ADJUSTING KNOB resists impact without transmitting it to precision internal parts. RUGGED FORGINGS of a new anodized aluminum alloy have more tensile and yield strength than brass forgings, and outstanding resistance to common corrosion. This new regulator just does not have a weak spot anywhere in its make-up. Put it on the job and don't worry—it will stay there. Available in both single and two-stage models for most gases. Send for new bulletin.

Sold also in Canada as "WELDCO"

**The K-G Equipment Company (Inc.)**

A Unit of Air Products, Inc.  
Dept. C, Box 538, Allentown, Pa.

For more facts, use Reader-Reply Card opposite page 18 and circle No. 292



## KONKURE Concrete Curing Compounds

Spray application curing membranes for freshly finished concrete surfaces—meets all city, county, State and Federal specifications.

Unexcelled concrete moisture retention gives maximum strength concrete, minimizes concrete surface failures\* or rainfall damage.

\*In hot, dry areas, use of Konkure White is especially recommended.

### GENERAL PURPOSE

**KONKURE Clear**—for curing concrete where retention of natural color is desired—a fugitive orange dye is used in Konkure Clear to insure application visibility—the color disappears within an hour.

**KONKURE White**—architecturally attractive, white pigmented, to minimize surface cracks resulting from exposure to light and heat rays in hot, dry areas.

**KONKURE Black**—an asphalt base waterproofing and curing compound competitively priced—also serves as a bonding agent for asphalt tile application.

**KONKURE Gray**—glare reducing—gray pigmented to minimize surface cracks resulting from exposure to light and heat rays in hot and dry areas.

### TILT-UP and LIFT-SLAB

**KONKURE P. C. C.**—a resin base curing compound and bond breaker combined—may be painted without treatment upon erection.

Write or Phone for Full Information

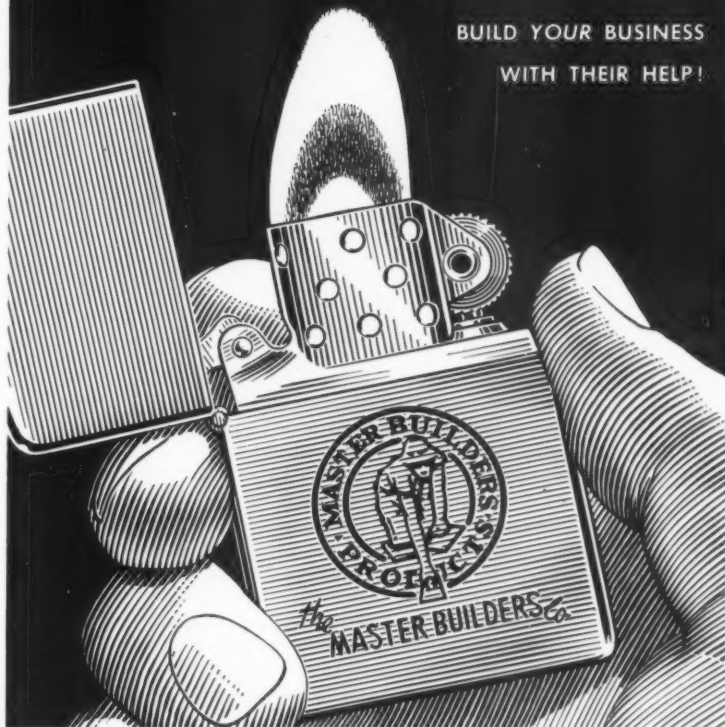
## KONKURE COMPANY

6742 Stanton Avenue, Buena Park, California Phone LAwrence 2-2841

For more facts, use Reader-Reply Card opposite page 18 and circle No. 293

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Whether you're a builder, prefabricator, subcontractor or supplier, the wide range of Zippo models will fit the full scope of your gift giving! Beautiful Zippos come in many prices and finishes—from gleaming chrome to 10-kt. gold-filled and solid precious metals.

They're world-famed for quality . . . sure to be appreciated and used many thousands of times over their long, long life. And your message flashes into view each time a Zippo flashes into flame!

**IMPORTANT:** Zippos also make wonderful INCENTIVE and RECOGNITION AWARDS . . . help you to get jobs done faster . . . recognize service anniversaries. Send coupon below for full story!

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For more facts, use coupon, or Reader-Reply Card opposite page 18 and circle No. 294

(Continued from preceding page)

lengths of the 66-inch pipe per load, since each length weighed about 13 tons. The pipe sections were unloaded and strung out along the right-of-way by a Caterpillar D8 tractor equipped with a side boom. Since the right-of-way was not always on solid and smooth ground, it sometimes required a lot of work to get the trucks in and the pipe unloaded.

Although the waterway crossings were let as a separate contract, they were done by other crews working for the same general contractor. These crossings were made with self supporting 100-foot spans of 66-inch steel pipe fabricated by Alco Products Inc., Dunkirk, N. Y. The ends of the pipe spans rested on concrete

piers, which were supported on Mono-tube piles driven 30 to 45 feet to bearing in the river-bottom material.

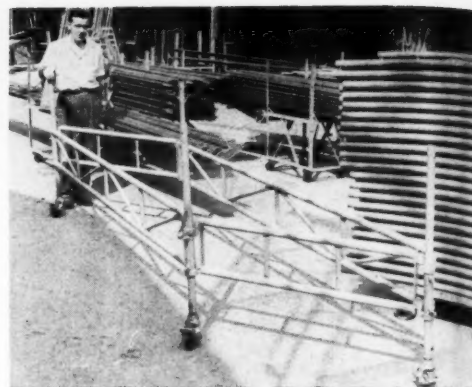
#### Personnel

Supervising the pipe-laying operations for Eby Construction Co., Inc., are superintendent Kenneth K. Johnston and project engineer Robert Seal. Construction of the waterway crossings was supervised by William D. Dopps. Hauling and spotting of the pipe were handled by Wayne Ellis. The consulting engineer, Black & Veatch, is represented by resident engineer John Knoll. Superintendent of the Wichita Water Department is Robert H. Hess.

THE END

Remember-Safety is no accident!

The Lo-Boy collapsible rolling scaffold.



#### Wheeled scaffold unit folds for easy moving

■ A 5-foot-wide wheeled scaffold that can be collapsed so that it will fit through a 2-foot-wide door without being dismantled is available from

the Superior Scaffold Co.

The Lo-Boy rolling scaffold is normally 5 feet wide and 10 feet long. By means of hinged corner posts, it can be pressed together so that it measures only 2 feet wide. The basic unit is adjustable up to 10 feet.

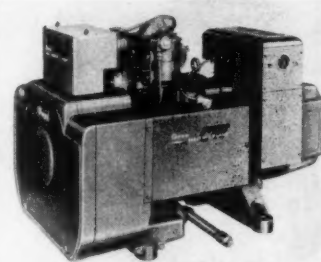
An easy exchange of standard parts on the unit is possible. For example, a 10-foot truss may be substituted for the usual 5-foot truss on larger installations.

For further information write to the Superior Scaffold Co., 5624 Bankfield Ave., Culver City, Calif., or use the Request Card at page 18. Circle No. 24.

#### Electric generating unit has new cooling system

■ A 7,500-watt, ac, air-cooled, gasoline-powered electric generating plant has been announced by D. W. Onan & Sons Inc. Patterned after the manufacturer's CW Series, which has been available in 5-kw and 10-kw capacities, the new 7½-kw rig features the Vacu-Flo cooling system, an Onan development.

Obtainable with skids or dolly, or for trailer mounting, the Model 705CW operates with a 2-cylinder opposed, 20-hp engine. The inherently regulated generator is of the four-



pole, self-excited, single ball-bearing type. Frequency regulation is 3-cycle maximum, while voltage regulation is plus or minus 3 per cent. The plant is available in remote starting only, in all standard voltages, frequencies, and phases.

The Vacu-Flo cooling system employs a centrifugal blower that pulls cooling air through the generator and over the heated engine parts and expels it through a duct.

The new rig can also be equipped with an all-weather heavy-duty 16-gage sheet steel housing.

For further information write to D. W. Onan & Sons Inc., University Ave. S. E., Minneapolis 14, Minn., or use the Request Card at page 18. Circle No. 10.

CONTRACTORS AND ENGINEERS



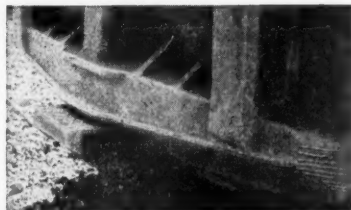
This special bucket has vertical bars welded in place to prevent "skulls," large slag deposits which build up in ladles, from clogging the bucket. Note the use of Stody 21 on the bars and the inside of the bucket. Monthly reapplications of hard-facing keep it in shape.

## GETTING BETTER SERVICE FROM ALL TYPES OF BUCKETS

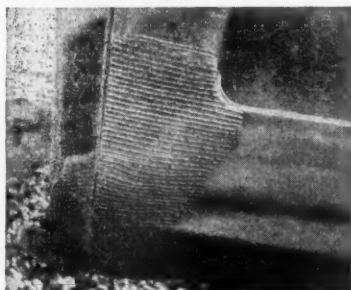
Down in Birmingham, Alabama, there is a company that really knows all about buckets—the Birmingham Slag Company. This organization is chiefly concerned with the reclamation of blast furnace slag which is crushed and treated for the production of an aggregate used primarily for road building. There are few materials more abrasive than this slag; ordinary buckets just can't take it without the protection afforded by extremely wear resistant hard-facing. This is true of all types of buckets used by Birmingham Slag Company...special shovel buckets handling the "skulls," clam shells and scoop lifts.

The pictures here pretty well tell the story. The company uses Stody 21 liberally as shown in the illustrations to protect teeth, lips, sides and runners. As wear occurs, reapplications of Stody 21 are made, as necessary, to keep the equipment in top operating condition.

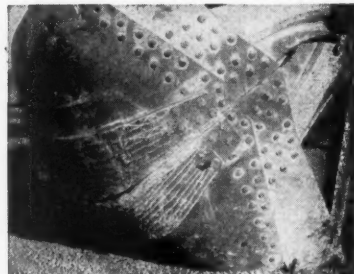
Get complete details on the use of Stody 21 and other Stody alloys; you'll find them in the Stody Guide-book, available from your dealer (consult the yellow pages of your telephone book)—or write to the company.



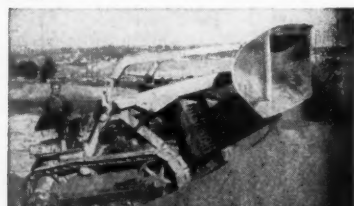
This latch plate also gets a Stody 21 treatment to prevent wear.



These Stody 21 beads across the bucket here resist severe abrasion as it is dragged across the rubble in the slag pit.



The lips on this clam shell are kept in good shape with beads of Stody 21 for a tight seal.



The scoop lifts handling crushed aggregate lead a rough life; Stody 21 keeps the lips, sides and bottom in condition. Occasional beads of this material are added as wear occurs.

**STODY COMPANY** 11936 East Slauson Avenue, Whittier, California

See the STODY EXHIBIT—WELDING SHOW—Buffalo, N. Y., May 9-11.  
For more facts, use Reader-Reply Card opposite page 18 and circle No. 295





A Kohler K90R gasoline 4-cycle engine provides the power for the Universal Formpacker.

### Portable tamper fits all standard forms

■ A portable tamping machine, said to be an answer to the problem of quickly and efficiently compacting soil beneath concrete-paving forms, is manufactured by the Western Form & Iron Co. The Universal Formpacker is available in left and right-hand models so that soil under both sides of a form can be compacted at the same time by the use of two rigs moving in the same direction.

The Formpacker is capable of operating at a rate of approximately 25 feet per minute and is reported to insure alignment to withstand the heavy weight of modern subgrading and finishing equipment. Adjustable, it fits all standard paving forms from 8x8 to 12x12 inches.

The tamping mechanism is operated from a countershaft driven by a traction shaft which is connected to a Kohler K90R engine. The power plant, which also moves the unit forward, develops 3.6 horsepower at 3,600 rpm and is equipped with a 6:1 reduction gear. The Formpacker weighs 330 pounds and is guided by an adjustable handbar.

For further information write to the Western Form & Iron Co., 1301 Washington Ave., Minneapolis, Minn., or use the Request Card at page 18. Circle No. 45.

### Rust prevention

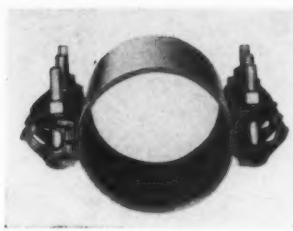
■ The 1956 edition of a rust prevention catalog is now available from the Rust-Oleum Corp. The catalog discusses rust prevention methods, and contains illustrations of Rust-Oleum uses and applications. Two pages are devoted to Rust-Oleum penetration through rust to bare metal as measured by radioactive tracer techniques, and the manufacturer's new Galvalume coatings which are formulated to be applied right over new galvanized aluminum surfaces without etching or excessive weathering.

To obtain Form No. 255 write to Rust-Oleum Corp., 2799 Oakton St., Evanston, Ill., or use the Request Card at page 18. Circle No. 7.

### Dual-purpose coupling repairs, connects pipe

■ A dual-purpose repair clamp for water, gas, or oil pipelines is manufactured by Smith-Blair, Inc. Recommended applications include the repair of cracked or broken pipe and the connecting of two lengths of cast-iron, steel, or asbestos-cement pipe in the trench.

The Full Circle clamp coupling embodies ball and socket, pivoting, ductile iron lugs, and free-floating bolts. The matching halves of the coupling are preassembled with the gridded gasket and its armored insert factory-bonded in accurate alignment. The bands are made of cold-rolled copper or stainless steel and are furnished with silicon bronze or



The Full Circle clamp coupling.

stainless-steel bolts.

Installation is accomplished by opening one side of the clamp and seating it on the pipeline.

For further information write to Smith-Blair, Inc., 535 Railroad Ave., South San Francisco, Calif., or use the Request Card at page 18. Circle No. 47.

### Concrete-gunning line

■ The complete line of concrete-gunning equipment manufactured by Air Placement Equipment Co. is detailed in a catalog. Some of the models shown are the Nucetor, Bondactor, and Airplaco portable concrete-gunning rig. Job photos illustrate use of the equipment in construction of reservoirs, swimming pools, irrigation ditches, and dry-block culverts; in repairing bridges and streets; and in building maintenance. Complete details, specifications, and operating capacities are included.

To obtain Form No. 156 write to Air Placement Equipment Co., 1009-11 W. 24th St., Kansas City, 8, Mo., or use the Request Card at page 18. Circle No. 51.

## SO AUTOMATIC AND INTERLOCKED

## this plant could be its own inspector



## The BUTLER 0-1-0 Roadbuilders Set-Up

Completely fool-proof, quality control and batching accuracy are *absolute* in the BUTLER 0-1-0. Every batch is the same. Banished are errors caused by operator fatigue.

Master Controls for each batcher are pre-set for any specified batch proportion and are not touched again until the concrete specifications are changed.

**ONLY ONE MAN**, stationed at the cement batcher, operates a simple set of push-buttons to control batching of all materials — sand, cement and 2 sizes of stone.

**ONLY ONE INSPECTOR**, (instead of three) is needed — and for all practical purposes he and the operator

can take turns going fishing. All gates are interlocked so they can't discharge until the correct weight is in the hopper. Nor can the batcher be charged until the previous batch is cleared.

And the BUTLER 0-1-0 is the world's most portable plant. Hours instead of days to erect or dismantle!

It all sums up to this: one man operation and high portability slash costs so drastically that the contractor with a BUTLER 0-1-0 can bid any job successfully and make a better profit against competition owning yesterday's equipment.

If preferred, instead of batching all materials from the central station, the truck drivers can batch sand and stone from cab by push button control mounted on bin columns.



Just off the press! A Bulletin completely describing the new automatic BUTLER 0-1-0. Write for it today. We'll send it to you — RUSH!

## BUTLER BIN CO.

971 BLACKSTONE AVE.  
WAUKESHA, WISCONSIN

For more facts, use Reader-Reply Card opposite page 18 and circle No. 296

The new Henry Model C-10H hydraulic backhoe with hydraulically controlled outriggers.

## Hydraulic outriggers aid straight-side ditching

■ A new hydraulic backhoe marketed by the Henry Mfg. Co., Inc., is equipped with either hydraulic or manually-controlled outriggers. The hydraulic outriggers ease the problem of straight-side ditching on sloping terrain, according to the manufacturer.

On the Model C-10H with hydraulic outriggers, the operator, without leaving his seat, touches a valve and in seconds the backhoe is leveled up for straight-side ditching on slopes with up to a 25 per cent grade.

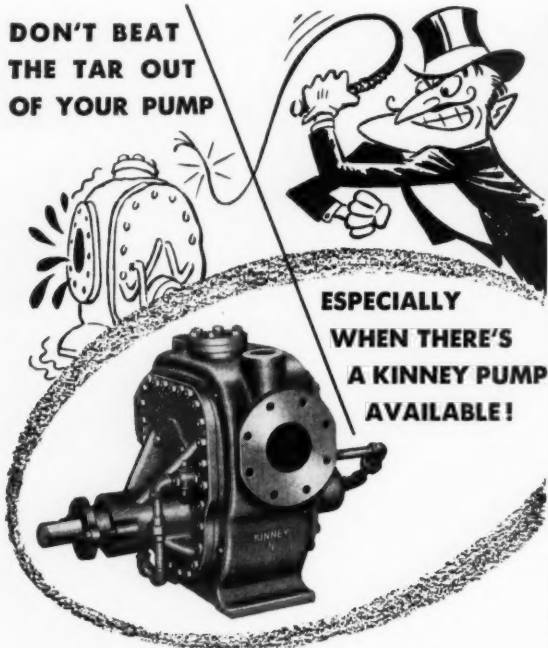
The manufacturer claims that the



Model C-10H is the only backhoe made with replaceable bronze bushings and large-diameter pins at all pivot points.

For further information write to Henry Mfg. Co., Inc., 1700 N. Clay St., Topeka, Kans., or use the Request Card at page 18. Circle No. 22.

## DON'T BEAT THE TAR OUT OF YOUR PUMP



Asphalt is hard to pump . . . for most pumps . . . but the Kinney® Model SD Rotating Plunger Pump makes the pumping of asphalts seem easy. Why? Because it is specifically designed to handle highly viscous materials with unusually high volumetric efficiency. How? Its simple, rugged design is completely free of valves, blades, springs or vanes . . . it is lubricated by the liquid pumped . . . and it is able to deliver difficult-to-handle liquids with meter-like accuracy.

For continuous, economical service . . . (some of these pumps have been pumping asphalt every day for over twenty-five years) . . . in sizes to suit your needs (available in capacities from 2 GPM to 3,000 GPM) . . . investigate the Model SD line of Kinney Liquid Pumps (steam-jacketed in most sizes). Clip coupon to your letterhead and mail today for complete data . . . or contact one of our competently staffed district offices . . . in Baltimore, Chicago (La Grange), Cleveland, Detroit, Houston, Los Angeles, New Orleans, New York, Philadelphia, San Francisco, or St. Louis.



**KINNEY MFG. DIVISION**  
THE NEW YORK AIR BRAKE COMPANY  
3531 WASHINGTON STREET • BOSTON 30 • MASS.  
INTERNATIONAL SALES OFFICE, 90 WEST ST., NEW YORK 6, N.Y.

• Please send Bulletin L51A describing the complete line of Kinney Liquid Pumps.

Name \_\_\_\_\_  
Company \_\_\_\_\_  
Street \_\_\_\_\_  
City \_\_\_\_\_ State \_\_\_\_\_

For more facts, use coupon, or circle No. 297

## Spray-Lube

for  
**OPEN GEARS**

**Spray-Lube Saves 95% of the Lubricant and does a 100% BETTER JOB!**

USE SPRAY-LUBE ON ALL GEARS NOT RUNNING IN OIL

- ★ A heavy black petroleum gear compound packaged in a spray container.
- ★ This grease is extreme pressure quality and ideal for the heaviest duty applications.
- ★ Many of the largest industries and contractors use and commend Spray-Lube.
- ★ Real gear protection summer or winter under the most adverse conditions.
- ★ No Waste - no mess - no bother - Every drop lubricates completely.
- ★ Spray container saves time and encourages proper gear lubrication.
- ★ Will not drip or throw off gears, but will adhere to any gear in any position.

**NO BRUSH • NO PADDLE • NO PRE-HEATING**  
Used on cranes, backhoes, shovels, rollers, rigs and winches.

**PP PRESSURE PRODUCTS CO.**  
P. O. BOX 342 WEST CHESTER, PA.  
Selected Dealership's Available  
For more facts, circle No. 298

## Leading Contractors Demand the Genuine "Mobile Office"

**GEORGE A. FULLER COMPANY**  
BUILDING CONSTRUCTION

**Ideal for—Offices • Drafting Rooms • Paymasters • Timekeepers • Engineers and many other uses conforming to the contractors' particular needs.**

Mobile Offices come equipped with drafting tables, desks, lavatory, air conditioning (optional), heater, etc., and can be equipped to your specifications. Units are built for rugged use. Many of these units are being used by leading contractors throughout the U. S.

Write today and get the complete facts on how mobile units can work for you.

**MOBILE OFFICE, INCORPORATED**  
7300 Stony Island Avenue, Chicago 49, Illinois  
PHONES DOOrchester 3-1048-9

For more facts, circle No. 299

## Add 11 new models to masonry drill line

■ The addition of 11 tungsten carbide-tipped masonry drills to the Proto line has been announced by the Plomb Tool Co. They are designed for drilling through concrete, brick, marble, granite, asphalt, stone, reinforcing steel, and steel beams embedded in masonry and other materials.

Six of the drills, for 3/16 to 1/2-inch holes, are the solid-cutter type with no dead center. The rest, for 5/8 to 1 1/8-inch holes, are the hollow-core type. They have three or more cutters which drill an outside ring, leaving an easily removed core.

According to the manufacturer, the new steels drill straight, clean holes, with no shattering or crumbling around the hole edges, no stalling or binding, and very little heat or noise. Multiple spirals speed the work by removing dust efficiently.

For further information write to the Plomb Tool Co., 2209 Santa Fe Ave., Los Angeles, Calif., or use the Request Card at page 18. Circle No. 11.

## Aggregate handbook

■ A reference handbook for aggregate producers, containing specifications and information on aggregate production and aggregate processing equipment is available from the Smith Engineering Works. A few of the topics covered in the 124-page handbook include aggregate specifications, analysis of aggregate processing equipment, conversion tables, weights and measures, volumes and surface areas of geometrical solids, and standard gages. Also included are the capacity and horsepower ratings of various units. Described and pictured are Telesmith equipment—apron feeders, jaw crushers, gyratory crushers, and scalpers.

To obtain the handbook write to Smith Engineering Works, 504 E. Capitol Drive, Milwaukee 1, Wis., or use the Request Card at page 18. Circle No. 60.

## Corrosion-resistant resins protect surfaces

■ A series of epoxy resins developed for corrosion-resistant surface coatings is announced by the Bakelite Co. These resins can be formulated into high-quality air-drying or baking finishes for steel, aluminum, zinc, tin plate, and wood.

The manufacturer states that the resins offer excellent adhesion and resistance to weather, salt spray, corrosive fumes, and chemicals. Properly formulated coatings based on the new resins can be applied to most surfaces by brush, spray, roller, flow or dip-coating. Once on, these coatings resist efforts of wear, abrasion, and impact to get them off.

For further information write to the Bakelite Co., Division of Union Carbide & Carbon Corp., 260 Madison Ave., New York 20, N. Y., or use the Request Card at page 18. Circle No. 120.

CONTRACTORS AND ENGINEERS





The Parsons Model 150 Trenchliner digs to 69 inches deep and to 26 inches wide.

### Hydraulic trencher unit digs to 69-inch depth

■ A fifth model of the Parsons Trenchliner, featuring hydraulic power for raising and lowering the digging wheel, has a range of digging speeds between 12 inches to 25 linear feet of trench per minute. Maximum digging depth is said to be 69 inches on the Model 150.

The wheel moves up and down a vertical mast. A wheel-hoist ram raises and lowers it to hold close grade tolerances at any digging depth. A separate mast-tilt ram holds the mast in vertical position and tilts it to bring the weight of the wheel forward for proper balance and clearance when traveling or loading on trucks or trailers.

The new Trenchliner is equipped with a selection of 30 digging feeds for varying soil conditions. The wheel has six cutting widths ranging from 16 to 26 inches. Power is supplied by a standard 60-hp engine, either gasoline or diesel. A choice of three bucket styles is available.

Other Trenchliner features pointed out by the manufacturer include all-welded unit-constructed main frame, shiftable and reversible arc-type spoil conveyor, dual-purpose friction-type clutch, and oil-bath-lubricated gears with sealed shafts mounted on antifriction bearings.

For further information write to the Parsons Co., P. O. Box 431, Newton, Iowa, or use the Request Card at page 18. Circle No. 77.

### Engineering data

■ Revised catalogs of pocket-size technical data sheets and books to be used by engineers, field technicians, foremen, and others, and covering every branch of engineering, are available from Lefax Publishers. One catalog contains an index of data sheets on the mechanics of materials, metals, piping, power transmission machinery, and hydraulic and highway engineering. Other topics included are building construction and design aids, reinforced concrete, steel forms and shapes, surveying tables, motors and generators, and general mathematics. The second catalog contains information on forms, binders, data sheets, and handbooks.

To obtain these catalogs write to Lefax Publishers, Ninth and Sansom Streets, Philadelphia 7, Pa., or use the Request Card at page 18. Circle No. 65.

### One lever controls 10-speed transmission

■ A truck transmission with ten forward speeds shifted by a single lever is in production by Mack Trucks, Inc. It is offered in three sizes for a wide range of highway trucks.

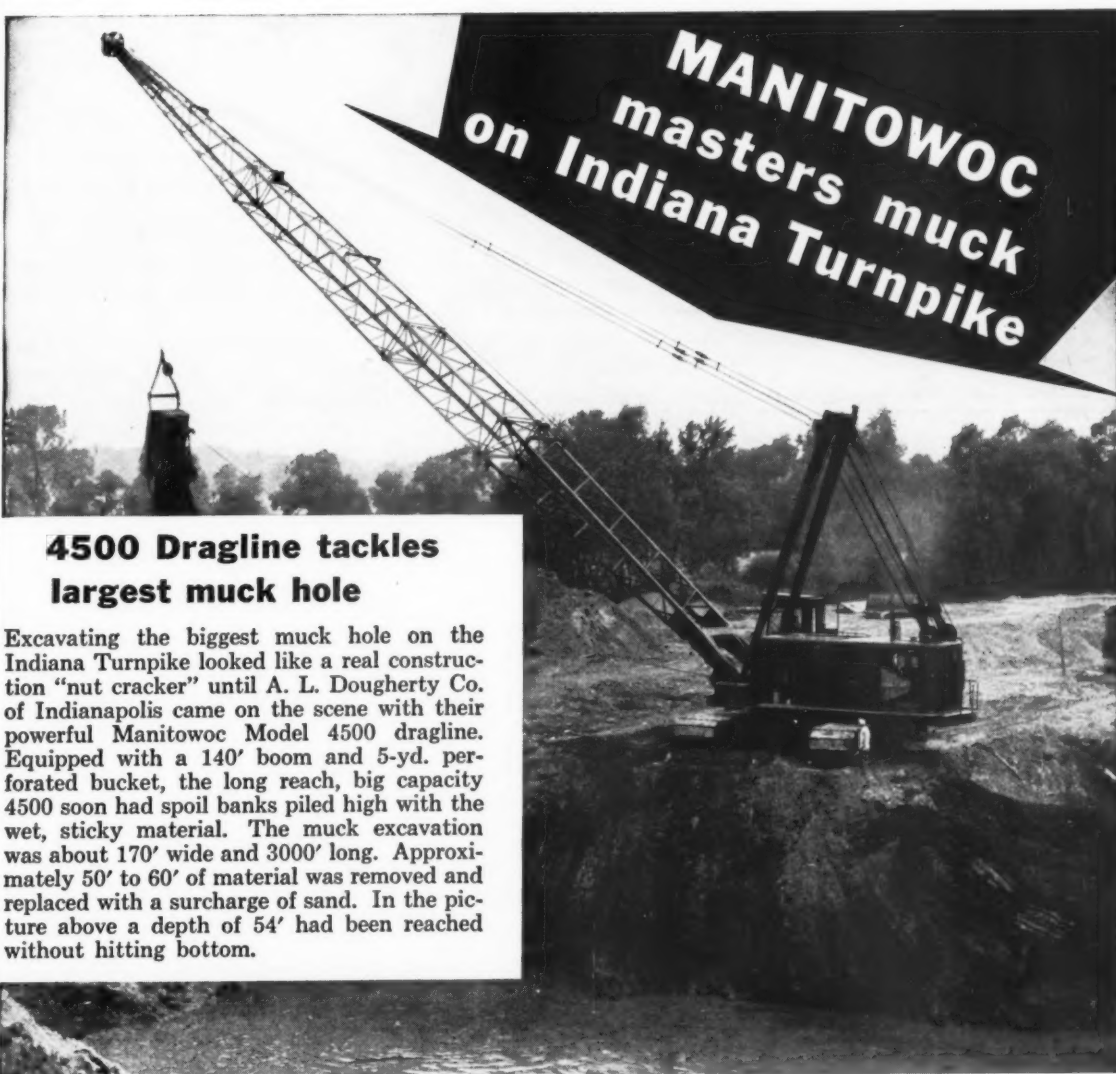
A five-speed main gearset and a two-speed compound with power-operated synchronized shifting is combined in the new transmission, which is called Unishift. It represents a further development of Mack's Mono-shift series.

Features of the new transmission include a broad range of gear ratios, simplified driver control, compact construction, the absence of an extra drive shaft and universals, and rapid, positive, quiet compound shifting.



The new Mack Unishift.

For further information write to Mack Trucks, Inc., 350 Fifth Ave., New York 1, N. Y., or use the Request Card at page 18. Circle No. 29.



### 4500 Dragline tackles largest muck hole

Excavating the biggest muck hole on the Indiana Turnpike looked like a real construction "nut cracker" until A. L. Dougherty Co. of Indianapolis came on the scene with their powerful Manitowoc Model 4500 dragline. Equipped with a 140' boom and 5-yd. perforated bucket, the long reach, big capacity 4500 soon had spoil banks piled high with the wet, sticky material. The muck excavation was about 170' wide and 3000' long. Approximately 50' to 60' of material was removed and replaced with a surcharge of sand. In the picture above a depth of 54' had been reached without hitting bottom.

### You need outstanding Dragline performance for tough jobs like this

● **POSITIVE STABILITY** assures full capacity buckets with any length boom. You get more heaped loads from one position, cutting down on the number of machine moves. Long, wide crawlers with low ground pressure let you work in soft, hard-to-reach spots and travel over soft ground without mats.

● **MORE POWER** through simple, clean design. There's less dead weight — less maintenance . . . more power for top performance every shift. Fewer parts provide more effective utilization of power. Fuel consumption is lowered for most economical operation possible with a machine of this size. Single diesel power plant eliminates need for several electric motors and thousands of electric wires and connections . . . greater mobility without dangerous, awkward cables dragging from machine.

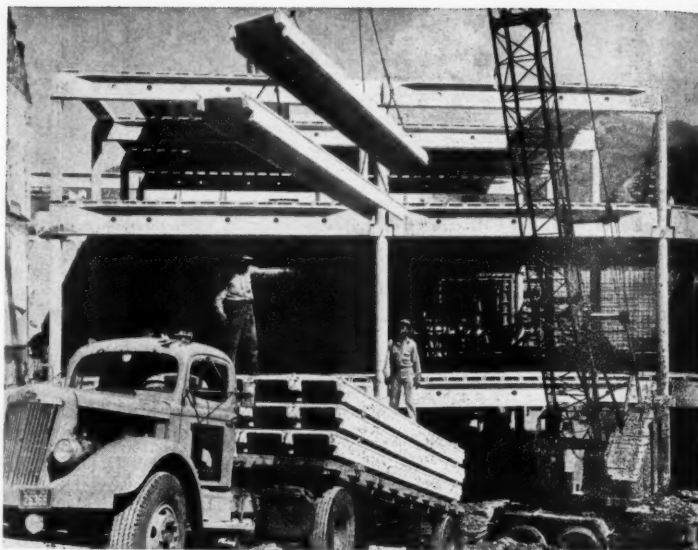
● **FAST CONVERTIBILITY** to shovel and crane operation makes the 4500 a versatile unit for any type of construction job. Big capacity, 5½-yd. shovel is engineered for your roughest jobs. 100 ton crane is ideal for heavy construction work. Manitowoc Engineering Corp., Manitowoc, Wis.

Your MANITOWOC distributor has all the facts on the Powerful 4500 . . . contact him now!

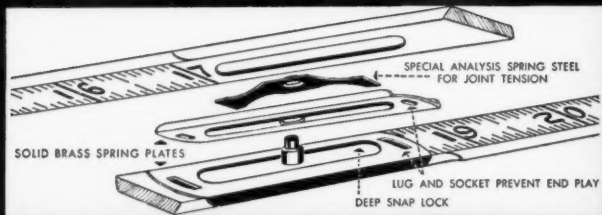


For more facts, use Reader-Reply Card opposite page 18 and circle No. 300

The precast-concrete channel-type floor slabs, delivered flat on the bed of a White truck, are lifted into place, two at a time, by a P&H 355-ATC truck-crane. Girders have been keyed into the corbel seats on the columns.



## WHY LUFKIN NEW Spring Lock Joints guarantee accuracy longer



Exclusive on "RED END" Folding Wood Rules



**X-46 EXTENSION RULE**  
6" brass slide for inside measurements. 50% heavier wood for extra heavy duty.



**066-RED END RULE**  
All Red End features but without extension.

**066-D ENGINEERS RULE**  
Red End quality, marked feet, 10ths and 100ths; and feet, inches and 16ths.

Exclusive Lufkin "Spring Lock" joints lock securely... eliminate end play... and maintain accuracy. Red End rules are straight-grained hard maple, tough and flexible. Bold black markings embedded in wood. Plastic coated for longer wear.

BUY **LUFKIN**

TAPES • RULES  
PRECISION TOOLS  
FROM YOUR SUPPLY STORE

THE LUFKIN RULE COMPANY  
SAGINAW, MICHIGAN

BETTER MEASURE WITH LUFKIN

399.

For more facts, use Reader-Reply Card opposite page 18 and circle No. 301



## Pump standards raised again

This year, A.G.C. standards have again been revised. They provide for increased performance, higher heads, in four sizes of pumps.

This is consistent with long maintained policy by which standards for both pumps and engines have been periodically reviewed and raised. Air-cooled engines on all A.G.C. rated pumps of 30M or larger sizes, for example, are today required to have stellite faced exhaust valves and valve seats, and valve rotators.



Demand this Rating Plate for your protection.

### CONTRACTORS PUMP BUREAU

Affiliated with The Associated General Contractors of America  
Munsey Building, Washington 4, D.C.

**BARNES MFG. CO.**  
Mansfield, Ohio  
**C. H. & E. MFG. CO.**  
Milwaukee 12, Wisc.  
**CARVER PUMP CO.**  
Muscatine, Iowa  
**CHAIN BELT CO.**  
Milwaukee 1, Wisconsin  
**CONSTRUCTION MCHY. CO.**  
Waterloo, Iowa

**ESSICK MFG. CO.**  
Los Angeles, Calif.  
**THE GORMAN-RUPP CO.**  
Mansfield, Ohio  
**THE JAEGER MACHINE CO.**  
Columbus, Ohio  
**LEYMAN MFG. CO.**  
Cincinnati 2, Ohio  
**MARLOW PUMPS**  
Ridgewood, New Jersey

**FOOD MACHINERY & CHEMICAL CORP.**  
Peerless Pump Division  
Los Angeles 31, Calif.  
**RICE PUMP & MACH. CO.**  
Belgium, Wisconsin  
**STERLING MCHY. COMPANY**  
Los Angeles, Calif.  
**WORTHINGTON CORP.**  
Contractor's Pump Division  
Plainfield, New Jersey

For more facts, use Reader-Reply Card opposite page 18 and circle No. 302

## Casting, handling methods hurry work on big store

By using some precast structural members, and others precast and prestressed by the Freyssinet method, Utah Construction Co., Salt Lake City, Utah, cut construction time of the three-story \$750,000 W. T. Grant Co. store recently completed in Ogden, Utah.

Designed by Nelson Rice, Los Angeles, architect, the building has an exterior of precast Mosai-type panels made with vari-colored aggregates that were partly stripped of concrete during the finishing process. This alone makes it one of the city's most dramatic looking buildings.

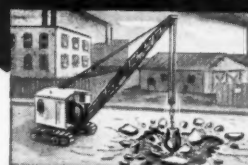
Measuring 96x172 feet, the structure has 51,000 feet of usable floor area in its basement and two upper stories. The building uses 16-inch round prestressed concrete columns, spaced 30 feet on centers one way

and 23 feet the other, with corbels at the floor points in the columns serving as catch-bed plates for prestressed concrete girder sections. These span between columns and tie to conventionally poured reinforced-concrete walls that form the outer shell of the basement. A rigid framework was made from this basic structure as steel anchors and clips embedded in the concrete members were welded after the assembly was complete. Precast, reinforced-concrete deck slabs of the channel type were then set in place over the girders and grouted to complete each floor.

### Simplify handling

During work on the structural portion of the new building, according to Art B. Smith, project manager for the contractor, congestion was elimi-

## TRUE RUGGED POWER that keeps costs down



### Frederick CAST semi-steel DROP BALLS

Get the wrecking power you want exactly where you want it with Frederick Drop Balls... tough, low cost production tools that stand up under constant punishment, with almost no maintenance. Extra durable nickel alloy is standard in all balls 4000 lbs. or over—or, we'll be glad to quote on special alloys if desired. Frederick's exclusive "Pear-shape" design drops straight—swings true—withstanding greater impact... "E-Z Swing" steel eye is recessed to give cable protection plus free-swinging action. Balls can be furnished with replaceable pins, if requested. Also available are special release hooks for free dropping.

### Wide range of sizes and weights:

Pear shape (lbs.).....	1500	2000	3300	4000	5200	6500	8000
Ball shape (lbs.).....	500	1000	2000	5200			
Spherical shape (lbs.)..	470	950	1650	2400	3000	3700	5400

Write us today for prices and illustrated literature. Order Balls direct or from your Equipment Dealer.

**FREDERICK IRON & STEEL, INC.**  
FREDERICK Established 1890 MARYLAND

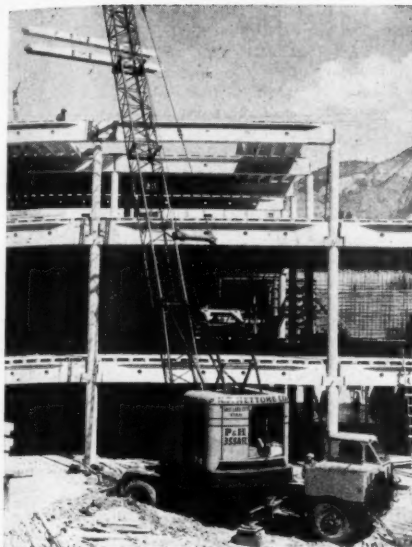
Phone MOument 3-5111

Makers of manhole frames, covers and steps • Storm Gratings  
Meter Frames and Covers • Centrifugal Pumps • Gray Iron Castings

For more facts, use Reader-Reply Card opposite page 18 and circle No. 303

CONTRACTORS AND ENGINEERS





Two of the deck slabs are hoisted from the truck to their final point of placement by the P&H. In addition to saving time, this direct-transfer method eliminates the need for storing the slabs.

### Precast and prestressed concrete structural members save time and costs in construction of new building

nated at the job site and time saved by the fast and simple method used to handle the concrete members. After columns had been precast and prestressed by Otto Buehner & Co. in its Salk Lake City yard, the members were laid flat on trucks so that no distortion would take place as they

were transported to the job.

Loads of precast-concrete deck slabs were also placed one row on top of another for delivery to the new building. At the site, a P&H 355-ATC truck-crane was used to hoist the members from the truck to their position in the building. **THE END**

### New flat-head studs for flush fastenings

■ Three new studs, designed for construction or maintenance fastening jobs where stud heads should be comparatively flush with the surface, have been introduced by Remington Arms Co. for use with powder-actuated tools.

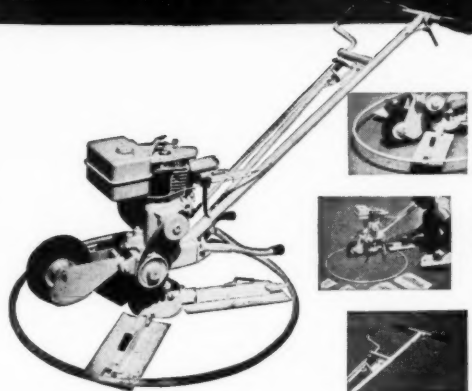
The studs have flat heads,  $\frac{3}{8}$  inches in diameter and  $\frac{1}{8}$  inch in thickness, and thin shanks. When they are used in Remington's Model 455 stud driver,

no extra washer or disk under the stud head is required. The thin shanks are said to assure less spalling.

One stud is  $1\frac{3}{8}$  inches long, another is  $2\frac{1}{8}$  inches long, and the third is  $3\frac{1}{8}$  inches long.

For further information write to Remington Arms Co., Inc., 939 Barnum Ave., Bridgeport 2, Conn., or use the Request Card at page 18. Circle No. 106.

## Only one man to move a White TROWELER



Retractable wheel, up to trowel, down to move.

Remove blades and ring in seconds... for cleaning, changing blades, or moving through doorways.

Adjust blade pitch during rotation from handle. Safety throttle control stops rotation if operator lets go handle.

PORTABILITY, patented, exclusive! PERFORMANCE, unbeatable! PRICE, comparable to trowelers without these features! Model T-1, 36" diameter, Patent No. 2,621,568.

## White MANUFACTURING COMPANY

ELKHART 9, INDIANA

For more facts, use Reader-Reply Card opposite page 18 and circle No. 304

MAY, 1956

Laws patterned on the Uniform Vehicle Code are a major object of 1956 state legislative attention, according to a survey made recently by the National Highway Users Confer-

ence. Measures proposed this year range from those incorporating entire chapters of the code to measures that would cover only individual sections.

### Save Time and Money..... PLUMB FACE AND SIDE WITH ONE READING



**Peerless**  
No. 208  
**CORNER PLUMB**

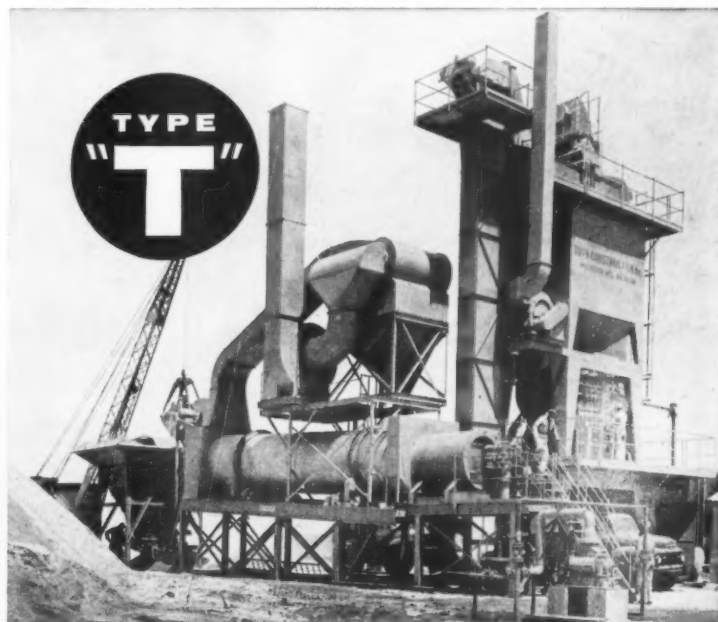
Made from Aluminum-Magnesium Alloy-Finished Blue Enamel  
Lengths as indicated below



Length	Wt.	Each
8"	2/3 lb.	\$ 9.95
16"	1 1/2 lb.	12.75

MANUFACTURED BY PEERLESS LEVEL AND TOOL COMPANY, STERLING, ILLINOIS

For more facts, use Reader-Reply Card opposite page 18 and circle No. 305



### Now Available With Automatic Cycle Control



Automatic Cycle Control—now on all H & B Type "T" and Mobile asphalt plants.

H & B Type "T" batch type asphalt plants, also the new Mobile completely portable batch plants, are all now equipped with automatic cycle control. This equipment provides for automatic control of the entire mixing cycle, with no loss of time between runs. The operation, however, is still fully under control of the operator, and may be interrupted at any time or operated manually in the conventional manner.

Automatic weighing is also available—as optional equipment—on both Type "T" and Mobile plants—in connection with the Fluidometer system and Automatic Cycle Control to make the entire mixer floor operation automatic.

Complete information about Automatic Cycle Control and completely automatic mixing and batching will be sent on request.

**HETHERINGTON & BERNER INC. • Engineers...Manufacturers**  
731 KENTUCKY AVENUE  
INDIANAPOLIS 7, INDIANA

For more facts, use Reader-Reply Card opposite page 18 and circle No. 306

## Cold asphalt emulsions

■ An illustrated bulletin containing detailed information on Laykold asphaltic concrete and Bit-U-Mix paving mixtures for all types of road construction is available from the American Bitumuls & Asphalt Co. The asphaltic concrete uses tempering fluid with asphalt cement for maximum workability of mix and longer pavement life, according to the bulletin. The paving mixture combining Bitumuls emulsified asphalt with hot aggregate is said to eliminate the necessity of heating binder and to improve general workability.

To obtain this bulletin write to the American Bitumuls & Asphalt Co., 200 Bush St., San Francisco, Calif., or

use the Request Card at page 18. Circle No. 16.

## Concrete resurfacer

■ Ruts and holes in concrete, brick, wood, and asphalt can be repaired with a ½-inch thickness of Stonhard Resurfacer, according to a folder from the manufacturer. One of the four steps points out that the resurfacer needs only to be mixed with cement, sand, and water, and then applied. The literature claims that the mixture, when dry, is non-skid, non-chipping, spark and fire resistant, and shock and sound absorbing.

To obtain this folder write to Stonhard Co., 1306 Spring Garden St., Philadelphia 23, Pa., or use the Request Card at page 18. Circle No. 84.

Double-acting hydraulic cylinders lift and control the bucket on the Farmhand Co.'s F-12 loader.



## New hydraulic loader for low-profile rigs

■ A hydraulic loader for low-profile tractors has been introduced by The Farmhand Co. Designated the F-12, the loader mounts on most low-pro-

file tractors now being used for non-farm loading and lifting. The unit has a 2,000-pound breakaway strength and 1,000-pound lift. Double-acting hydraulic cylinders are used for lifting and controlling the bucket. A special cross-tie equalizes stress, adds to stability, and minimizes sidesway.

The F-12 is available with both 9 and 16-cubic-foot material buckets which can be attached in minutes. There is also a small dozer blade, as well as a dozer blade extension, for moving dirt, sand, or gravel.

For further information write to the Farmhand Co., Hopkins, Minn., or use the Request Card at page 18. Circle No. 39.

## Gardner-Denver... Serving the World's Basic Industries

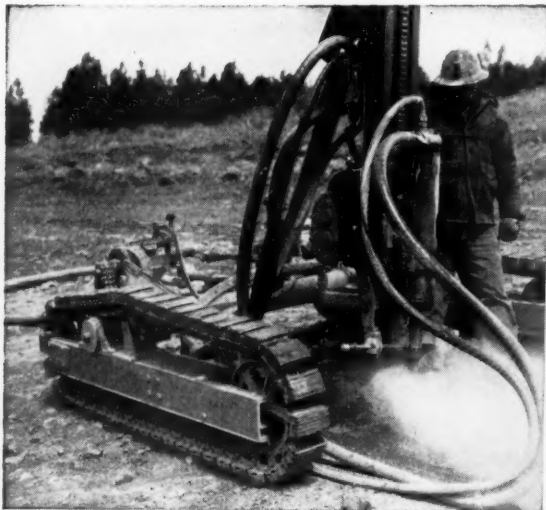


Clambers over rock



Scoots uphill

## Goes most anywhere...tows own air power Gardner-Denver self-propelled Air Trac



Puts holes where you want them



Tows its own compressors



Send for the bedrock facts on Gardner-Denver's Air Trac®

## GARDNER - DENVER

THE QUALITY LEADER IN COMPRESSORS, PUMPS, ROCK DRILLS AND AIR TOOLS FOR CONSTRUCTION, MINING, PETROLEUM AND GENERAL INDUSTRY

Gardner-Denver Company, Quincy, Illinois

In Canada: Gardner-Denver Company (Canada), Ltd., 14 Curly Avenue, Toronto 16, Ontario

For more facts, use Reader-Reply Card opposite page 18 and circle No. 307

## Oil filter replacements

■ Fram lube oil and fuel oil replacement cartridges for road-construction equipment are listed in a 32-page catalog. The tables list the proper replacement cartridge for various makes of graders, tractors, rollers, engines, compressors, and other allied machinery. The charts are arranged according to an alphabetical listing of manufacturers, and include the various models made by the companies.

To obtain this catalog write to Fram Corp., Pawtucket Ave., Providence 16, R. I., or use the Request Card at page 18. Circle No. 100.

## Steel-mesh floor armor

■ Gridsteel, a steel-mesh floor armor, is illustrated in a catalog from the manufacturer, Irving Subway Grating Co., Inc. Made of steel bars on edge, bent and joined together in a continuous hexagonal mesh pattern, the steel flooring may be placed over any type of old floor surface or incorporated with new flooring. After installation, Gridsteel is generally filled with concrete or mastic.

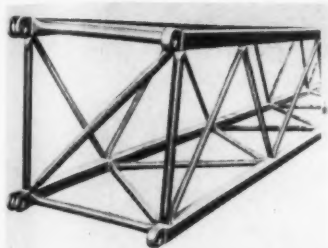
To obtain this catalog write to Irving Subway Grating Co., Inc., 5026 27th St., Long Island City, N. Y., or use the Request Card at page 18. Circle No. 156.

## Parsons Co. appoints two new sales representatives

The Parsons Co., Newton, Iowa, manufacturer of a full line of trenching equipment, has appointed two new sales representatives, John J. Harvey and Eugene H. Nelson. The firm is a subsidiary of the Koehring Co., Milwaukee, Wis.

CONTRACTORS AND ENGINEERS





lacing surfaces on the new Lorain booms are within the outer faces of the square tubes, thus protecting the lacing from damage.

### Control, boom features improve shovel line

■ Simplified air-operated controls and all-welded crane booms with main chords of square tubing are new features of the Thew Shovel Co. line of Lorain cranes and power shovels. The booms are standard on nine models, while the air controls are available by option on eight models in the 20 to 30-ton capacity class.

The Air-Ease controls operate all friction clutches by full metered-air power. Only two levers are used—instead of the conventional four or more—to control all operations. Metered air also controls the travel of the self-propelled rubber-tire models.

With the two-lever system, single operations are performed by moving a lever to the right or left, or forward or back. Various combinations of operations are performed by moving a lever diagonally. This "blending" of operations is made possible by a multiple air valve at the base of each lever which, when opened, applies metered air through Roto-Chambers or air cylinders to engage friction clutches.

The manufacturer claims that the use of square tubular main chords in the booms results in a 15 per cent increase in column strength per linear foot over round tubes and a 90 per cent increase over chords of angular cross section, of the same material. The newly-designed booms are said to weigh 20 to 30 per cent less than those utilizing conventional tubes or angle steel.

The lacing in the new boom is continuous. It is preformed to proper shape before being welded to the square chords. The lacing is protected from damage because all its surfaces are within the outer faces of the square tubes.

For further information write to the Thew Shovel Co., 28th and Fulton Road, Lorain, Ohio, or use the Request Card at page 18. Circle No. 72.

### Oriented diamond bit

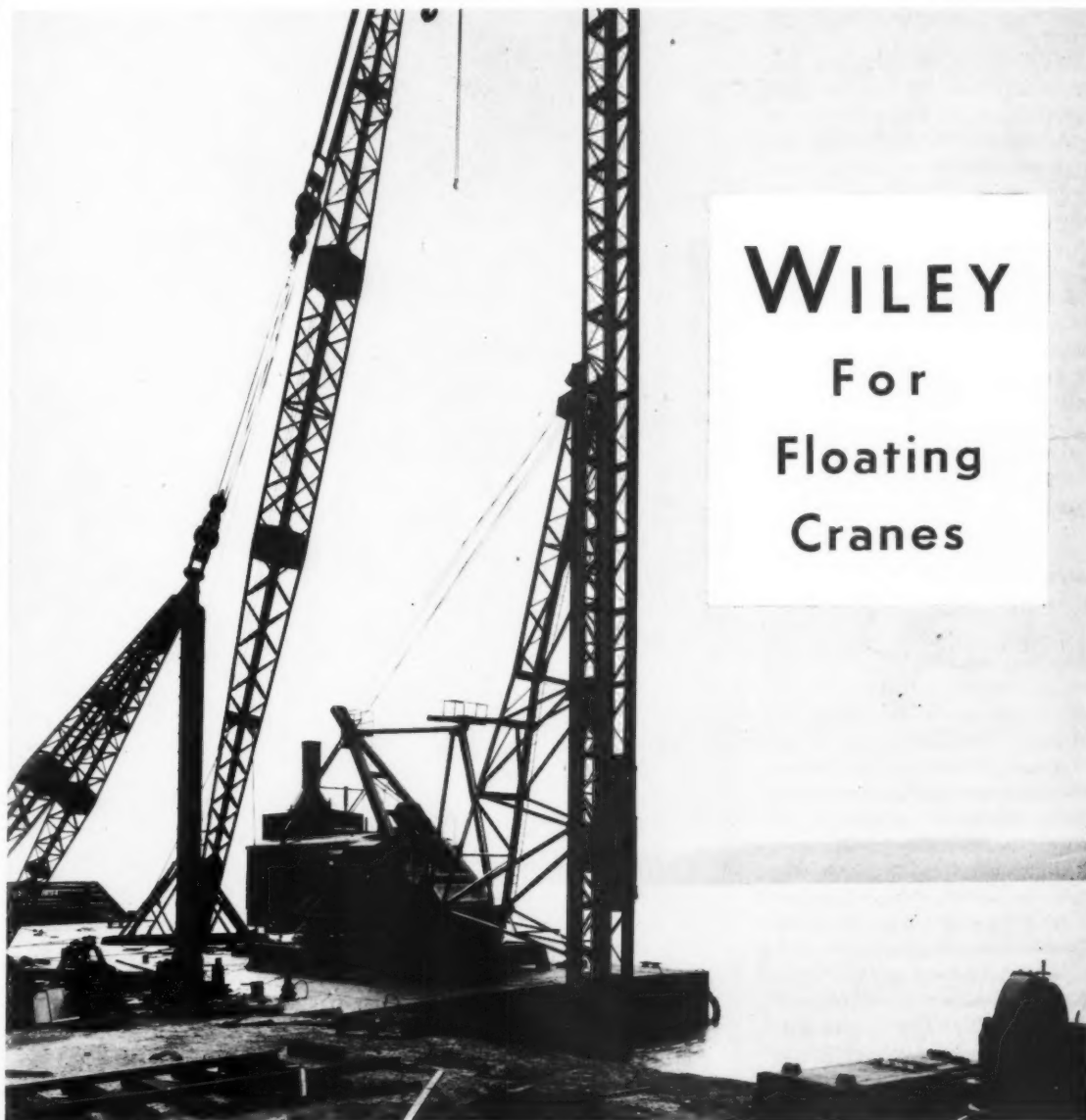
■ A new catalog which discusses oriented diamond bits is announced by Sprague & Henwood, Inc. The publication illustrates and describes all types of oriented diamond coring bits, non-coring bits, casing bits, casing shoe bits, reaming shells, and impregnated coring bits.

To obtain Bulletin No. 320-1, write to Sprague & Henwood, Inc., 221 W. Olive St., Scranton, Pa., or use the Request Card at page 18. Circle No. 17.

MAY, 1956



A POWER SERVICE TRAINING PROGRAM sponsored by International Harvester Co., Chicago, Ill., has gone into operation at the company's Melrose Park, Ill., plant. Known as Melrose Tech, the school provides every type of training needed to educate company and distributor service personnel. Students spend 49 class hours during the week-long course learning assembly and disassembly of International equipment. Training aids, such as slide films and manuals, are used extensively in this do-it-yourself program. The course will be continued for seven weeks.



Wiley Floating Pile Driving Unit, a full circle pile driving unit, constructed to handle vertical or battered piles over the end of the barge or over the side. Two units of this type owned and operated by the Frederick Snare Corporation. For dependable floating equipment, discuss your requirements with Wiley Engineers.

**WILEY** MANUFACTURING COMPANY  
BARIUM STEEL CORPORATION SUBSIDIARY

P.O. BOX 97, PORT DEPOSIT, MARYLAND

PHONE: PORT DEPOSIT DRAKE 5-2111

For more facts, use Reader-Reply Card opposite page 18 and circle No. 331



Ingersoll-Rand's new Gyro-Flo 900 compressor.

### Add 900-cfm compressor to portable rotary line

■ Ingersoll-Rand has announced the addition of a 900-cfm rotary portable compressor to its Gyro-Flo line, bringing to five the number of sizes available. The line previously consisted of 125, 210, 315, and 600-cfm models.

The Gyro-Flo 900, weighing just over 7 tons and only slightly larger than the Gyro-Flo 600, is powered by a GM Series 110 diesel engine. The 6-cylinder 2-cycle engine utilizes a 24-volt battery and an ether-capsule system to insure starting at extremely low temperatures.

Delivering 900 cfm at 100 psi, the new Gyro-Flo is said to be able to operate 10 jackhammers, or seven wagonjacks with light drifters, or three wagon drills with heavy drifters.

For further information write to the Ingersoll-Rand Co., 11 Broadway, New York 4, N. Y., or use the Request Card at page 18. Circle No. 27.

### Layout tapes

■ A line of colored templets and colored continuous layout tapes is illustrated and described in a folder from the manufacturer, Repro-Templets, Inc. According to the folder, this method of color coding can be used for master layouts, production-control charts, graphs, space-assignment charts, continuous inventories, and other job plans. The folder shows three groups of design: chart tapes, including arrows, broken lines, and dotted lines; layout tapes for continuous-operation equipment; and architectural-detail tapes for walls, partitions, columns, and power outlets.

To obtain this folder write to Repro-Templets, Inc., Oakmont, Pa., or use the Request Card at page 18. Circle No. 58.

### Entrained-air meter

■ The Acme air meter measures the entrained air in concrete and the air held within the pores of the aggregates, according to a folder from E. W. Zimmerman Co. The completely self-contained unit is said to complete the test in 5 minutes. The folder states that the 22-pound magnesium-alloy air meter is not affected by contact with the concrete.

To obtain this folder write to E. W. Zimmerman Co., 228 N. La Salle St., Chicago 1, Ill., or use the Request Card that is bound in at page 18. Circle No. 67.

### Travel torch announced in automatic model

■ Arcair now offers the Model L-3 automatic-travel torch, said to make gouges on all metals as smooth as those cut by any machine operation. Formerly only manual models of the Arcair torch were available.

The new model is especially recommended for use in long gouges, cuts, or bevels, and where there are no intricate configurations or complicated lines of travel. It is held and moved by a machine on a track. On circumferential seams it is held in a fixture while the work is rotated.



The Arcair Model L-3 automatic travel torch.

The Model L-3 is designed to take electrodes up to 3/8 inch in diameter. A larger version, the Model L-5, is



## Portable plant produces hot-mix at 175 tph clip from wet river gravel

**TAKES ONLY 1.8 GALLONS OF FUEL TO DRY A TON OF WET MATERIAL**

Fuel consumption of 1.8 gallons per ton while drying *wet river gravel* to produce a high type hot-mix at a 175 tph clip is outstanding performance in any contractor's language.

That was the record compiled by this PIONEER Continuflo Model 102 Asphalt Plant between Belleville and Ravenswood, West Virginia, where Route 2 hugs the Ohio River.

Gravel for the job was scooped up from the river bottom by a modern floating dredge. It was still saturated with Ohio River water when delivered to the plant.

The happy contractor was Tri-

State Asphalt Corporation of Martins Ferry, Ohio.

Tri-State already owned 8 stationary or semi-stationary mixing plants, but needed a high-tonnage, highly mobile plant to help it maintain a competitive advantage in the 5-state area of Ohio, Pennsylvania, West Virginia, Maryland, and Kentucky where it regularly operated.

#### Highly Mobile

It was after placing its order for the new PIONEER Model 102 Continuflo Plant that Tri-State submitted the low bid on the 50,000 ton

Route 2 paving job mentioned above.

Its exceptional mobility was one of the features which influenced Tri-State in selecting a Continuflo Plant. There are only 2 units to move. The combination drier and dust collector is mounted on one rubber-tired chassis; the combination gradation-mixing unit is on another. No extra piping or breaching is needed to connect dust collector with drier. It's a simple matter to pull in, hook up, lay pipes, and go to work.

#### Economical, too

One of the reasons Tri-State's Continuflo Drying Unit requires so little fuel and power is that the direct,



made for electrodes up to  $\frac{3}{8}$  inch.

For further information write to the Arcair Co., 419 S. Mt. Pleasant St., Lancaster, Ohio, or use the Request Card at page 18. Circle No. 38.

### Hot-water heater for motor graders

■ A high-output hot-water heater has been announced by Caterpillar as an attachment for the No. 12, No. 112, and No. 212 motor graders. The heater is available to match either 6 or 24-volt electrical systems.

The new unit is equipped with two individually - controlled blower fans



New water heater (arrow) installed on flat motor grader.

capable of providing an air output of 620 cfm. Rated capacity of the new unit is approximately  $2\frac{1}{2}$  times that of the single-fan heaters previously used.

For further information write to the Caterpillar Tractor Co., Peoria 8, Ill., or use the Request Card at page 18. Circle No. 21.

### Lightweight chain saw operates at all angles

■ A 19-pound, direct-drive chain saw rated at 5 horsepower is announced by Homelite.

The light weight of the Model EZ



The Homelite EZ direct-drive chain saw.

makes it ideal for limbing or undercutting, as well as felling, bucking, notching and boring, according to the manufacturer. An all-angle diaphragm carburetor permits cutting in any position.

Available with 12, 17, 21, 25, and 30-inch guide bars, the EZ is said to cut through 8-inch oak in 5 seconds and 18-inch pine in 14 seconds. It will bring down trees up to 3 feet in diameter easily, the company reports.

For further information write to Homelite, 75 Riverdale Ave., Port Chester, N. Y., or use the Request Card at page 18. Circle No. 36.

### Portable troweling rig duplicates hand motions

■ A portable power troweling machine for smoothing and finishing poured concrete is announced by the construction equipment division of Thor Power Tool Co.

The Thor T-29 duplicates the mo-



tion of hand troweling by means of a gang of three trowels moving in a circle from a central shaft.

A Briggs & Stratton 2-hp gasoline engine powers the machine, which is operated by one man. Center-blade suspension permits fingertip control of the trowel movement and a stationary guard ring allows its operation close to walls, pipes, and other projections.

For further information write to the Thor Power Tool Co., 175 N. State St., Aurora, Ill., or use the Request Card at page 18. Circle No. 33.

### Blacktop road equipment

■ A revised 36-page booklet on blacktop road maintenance and construction equipment has been announced by Littleford Bros., Inc. Units described and illustrated include Littleford's engineered pressure distributors, supply tanks, sprayers, brooms, asphalt kettles, heater-planer, rollers, and accessory tools.

To obtain Catalog GG write to Littleford Bros., Inc., Box 97-485, E. Pearl St., Cincinnati 2, Ohio, or use the Request Card at page 18. Circle No. 18.



straight-line connection between drier and dust collector offers less resistance to air flow than old-fashioned plants with their multi-bend piping and breeching. Less heat is wasted, and since more heated air is pulled through the drier for each hp input to the induction fan, less power is needed to do the job.

Another major saving is made possible by the high efficiency of PIONEER's multi-clone dust collector which saves on the cost of mineral filler by recovering up to 20 tons of needed fines per hour and feeding them back into the mixer.

#### 4-Compartment Bin

Another feature of the 102 Plant which had helped influence Tri-State was the fact that it offered a 4-compartment bin.

Specifications of both the Ohio and Pennsylvania Highway Departments call for 4-bin separation of

bituminous mix aggregates, and even where this is not required, the high output of the 102 Plant puts Tri-State in an advantageous position when bidding is close.

#### Accurate Proportioning

Three other important *Continuflo* advantages make it easy to maintain near-perfect uniformity of mix to meet even the most exacting specifications.

**FIRST** . . . gradation bin gates are calibrated to make it easy to proportion dry aggregate.

**SECOND** . . . hot, dry aggregates are mixed before bitumen is added.

**THIRD** . . . aggregates feeder and bitumen pump drives are *mechanically interlocked* to maintain correct proportioning.

A specially designed double gate

on the truck-loading hopper reduces segregation to a minimum and quick-acting controls give the operator instant and positive command over all mixing functions.

The Model 102 *Continuflo* Plant is available with diesel, diesel-electric, or all-electric power. All-electric plants are controlled from a central push-button panel.

For more information on the 102 or other PIONEER *Continuflo* Bituminous Plants, write Pioneer Engineering Works, Inc., Minneapolis, Minnesota (a subsidiary of Poor & Company, Chicago) or see your nearest PIONEER Distributor.

**Pioneer**  
*Continuflo* EQUIPMENT

For more facts, use Reader-Reply Card opposite page 18 and circle No. 308



A workman drives home Setlock cap with a special tool and rubber-faced hammer.

### Stud-welded fastener uses aluminum cap

■ A stud-welded construction fastener with an aluminum cap which is said to permit faster field assembly and improve the appearance of insulated metal sandwich and other curtain walls is being manufactured by the Nelson Stud Welding Division of Gregory Industries, Inc.

The Setlock fastener system employs a steel shoulder-type stud with a serrated tip that is end-welded to structural girts with a Nelson stud-welding gun. In sandwich-type construction, first the inner skin, then the insulation, and finally the exterior material is impaled over the

stainless-steel, cadmium-plated or mild-steel stud (depending on the materials and climatic conditions).

The Setlock cap is then placed over the serrated tip of the stud and driven into position with a tool which causes the aluminum to flow into and grip the serrations. The manufacturer states the fastener has a holding power of more than 800 pounds on a direct pull.

For further information write to the Nelson Stud Welding Division, Gregory Industries, Inc., 2715 Toledo Ave., Lorain, Ohio, or use the Request Card at page 18. Circle No. 28.

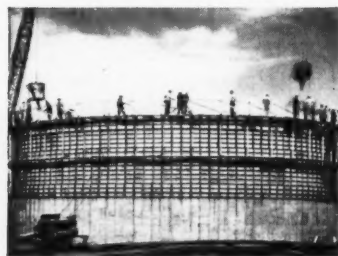
## UNI-FORM Concrete Forms

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UNI-FORM Concrete Forms are prefabricated steel-framed, plywood faced panels . . . ready to use when they reach the job. UNI-FORM Ties and Keys lock and spread Panels into an automatically accurate form. No measuring — no guesswork. Completely versatile . . . they form straight, battered, circular, irregular or curved walls at lowest all around cost.

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UNI-FORMS provide faster, simpler and easier circular wall forming . . . one side alignment and bracing . . . absolute control of concrete, and safer, cleaner working areas.

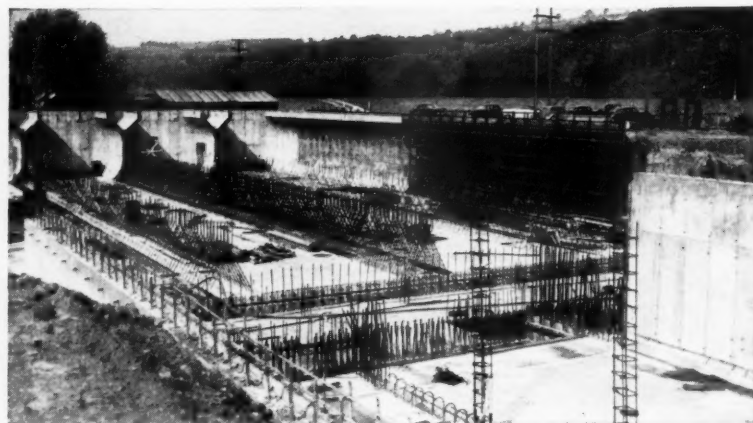
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## Unique Prefab Form System Speeds Sewage Plant "Y" Wall Construction



MECHANIZED FORMING with new "Y" wall trusses and UNI-FORM Panels speeds construction, saves labor and material

Field reports on a new system for forming "Y" walls in aeration tanks and settling basins indicate very satisfactory operation and important labor and material saving advantages for the system.

Developed by the Universal Form Clamp Co., Chicago, the new system is said to completely eliminate the many problems and difficulties encountered by contractors in forming this special type of wall in sewage disposal plant construction.

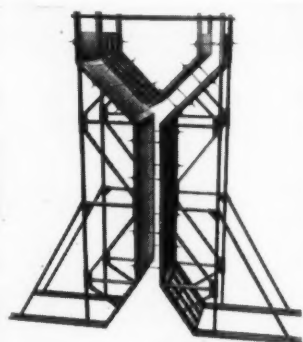
Specially designed trusses, which can be made to handle any type, height, shape or wall thickness, are used in conjunction with standard UNI-FORM Concrete Forms to form the "Y" wall. Assembly of the truss and UNI-FORM Panels into a complete form, ready to receive concrete is a fast, mechanical operation. Positive internal spreading and accurate wall thicknesses are assured by the use of Universal Spirloc Cone Nut Assemblies.

Features incorporated in the design and operation of the Universal "Y" wall form-

pieces or as a large unit. Both methods have been very successfully used on recent projects.

Because standard UNI-FORM panels are used to form a large percentage of the "Y" wall contact area, it is possible to strip all UNI-FORM panels within a very short time after the actual pouring of concrete, leaving the trusses in place to provide the necessary support for the required period of time.

In this way, faster forming cycles, using minimum UNI-FORM equipment are pos-



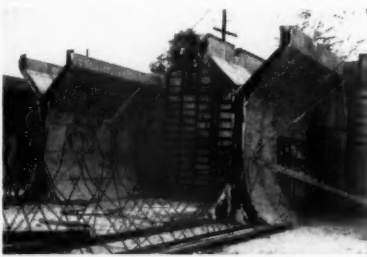
ASSEMBLED SECTION of "Y" wall truss with UNI-FORM Panels

sible, resulting in lower labor and material costs. UNI-FORM Panels are rented or sold, or rented with an option to purchase.

For complete details on Universal "Y" wall forms and UNI-FORM Panels, Write:

**UNIVERSAL FORM CLAMP CO.**  
1238 North Kostner Avenue  
Chicago 51, Illinois

Distributors and Branches in Principal Cities



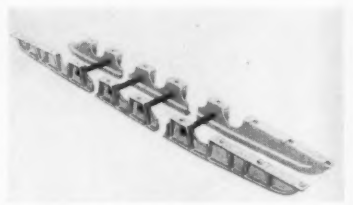
STRIPPED WALLS are clean and accurate. The system eliminates the necessity of additional lumber or tying devices for the alignment and bracing of the unit.

Erection, stripping and movement of the form can be handled either as individual

### New parts available for crawler tracks

■ Improved versions of three tractor track parts—grouser pads, sprocket rims, and rock guards—have been announced by Hensley Equipment Co.

Used for protection of roller tracks against excessive rock damage, the new rock guards come in three pieces to permit sectional removal for serv-



Hensley rock guards come in three parts for sectional servicing of tractor rollers.

icing of the rollers. They are heavily ribbed at the points of greatest stress and strain.

The Hensley weld-on sprocket rims permit use of the same hubs, with the rims easily replaced. The moly-manganese-chrome steel is said to weld easily when preheated. A low-hydrogen welding rod does the job quickly.

Designed to fit heavy-duty Caterpillar, International, and Allis-Chalmers tractors, the heavy-duty grouser pads are made of special alloy steel. Counter-sunk bolt holes permit the use of the original bolts when replacing the rails.

For further information write to Hensley Equipment Co., Inc., 800 Peralta Ave., San Leandro, Calif., or use the Request Card at page 18. Circle No. 75.

### Air compressors

■ A line of air compressors for cleaning machinery, inflating tires, oiling springs, cleaning engines, and blowing out fuel lines is presented in a folder from the American Brake Shoe Co. Four portable models and two stationary units are shown. The specification chart lists 19 models with horsepower ratings of from 1/3 to 1 1/4, and psi ratings of from 125 to 150.

To obtain this folder write to the American Brake Shoe Co., 230 Park Ave., New York 17, N. Y., or use the Request Card at page 18. Circle No. 88.





The new portable Seismolog records earth tremors resulting from blasting and other construction operations.

### Records earth tremors for lawsuit protection

A lightweight, portable seismograph recommended for use in recording and analyzing impact vibrations in construction work has been developed and is now being manufactured by Vibration Measurement Engineers, Chicago, Ill. The instrument, called the Seismolog, is particularly applicable to operations involving the use of commercial explosives.

With the Seismolog, evidence of scientifically measured earth tremors is photographically recorded. The records are kept on file by Vibration Measurement Engineers through statute of limitations periods in the event of lawsuits arising from blasting operations.

In addition to blasting operations, such as in quarrying, tunneling, sewer work, highway construction, and dredging, the Seismolog records impact vibrations from pile driving and other operations where ground tremors and vibrations result.

The Seismolog is made portable by means of a two-section, low-voltage battery pack designed for the instrument by General Dry Batteries, Inc., Cleveland, Ohio. The instrument weighs 40 pounds in its case and measures 9 x 13 x 19 inches.

For further information write to Vibration Measurement Engineers, 7665 N. Sheridan Road, Chicago 26, Ill., or use the Request Card at page 18. Circle No. 70.

### Wire-screen cloth

Wabblly Weave, a screen for sand, gravel, stone, and other hard materials, is described in a catalog from HarriSteel Products Co. A photograph compares the Wabblly Weave woven wire screen, which is said to remain free of plugging, with a regular screen, which the manufacturer claims showed 95 per cent plugging after 9 days' operation.

To obtain the catalog write to HarriSteel Products Co., 420 Lexington Ave., New York 17, N. Y., or use the Request Card at page 18. Circle No. 56.

### New Austin sales manager

Richard S. Nelson has joined the Austin Overshot Loader Co., Galion, Ohio, a division of Hercules Galion Products, Inc., as sales manager. He will be responsible for both domestic and export sales of Austin Overshot loaders, bulldozer blades, grizzly screens, and other attachments.



THE ROCKS IN THE FOREGROUND were picked up by this Bestland Rockmaster on a recent clearing project. The hydraulic rock-picker is recommended for use on pipeline projects, dams, and other large construction jobs. Without leaving his seat, the operator can raise the loaded tines to the hopper box and discharge the hopper box load into a waiting truck, by means of a hand-operated lever. The spacing of the tines is adjustable on all models of the Rockmaster. For details write to the Viel Distributing Co., P. O. Box 632, Billings, Mont., or use the Request Card at page 18. Circle No. 116.

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For the first time you can burn fewer gallons of low-cost Diesel fuel in both truck crane engines. Use of 2 similar type P&H Engines also results in easier understanding and better maintenance of both engines by one man. Savings are substantial, too, on parts inventorying and repair costs. All wearing parts are interchangeable between P&H Engines.

If you want money making and money saving power, it will pay you to investigate the complete powering of your truck cranes with P&H Diesels.

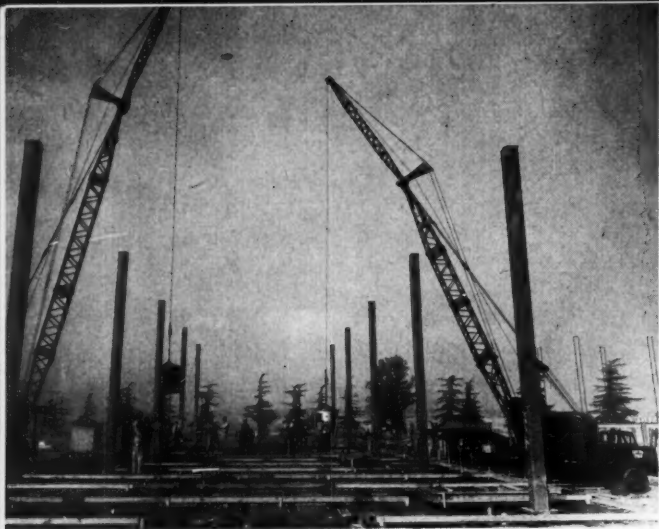
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For more facts, use coupon, or Reader-Reply Card opposite page 18 and circle No. 310



Lorain truck-cranes team up to place concrete over reinforcing and cardboard paper forms. Only the simplest kind of lumber forming is required for the various size slabs.

## Lift-slab refinements cut working time on hospital

*Innovations in techniques permit contractor to finish 22-slab concrete floor sections in 41 working days*

A number of innovations in construction, combined with the lift-slab technique, are making work swift and economical on the new 139-bed Methodist Hospital of Southern California, near Arcadia.

Cardboard boxes being used to form blockouts in the slabs, and the use of square instead of round steel columns—techniques perfected on recent jobs—are helping to save time on this job. The Youtz-Slick lift-slab method is being used with a new type of hydraulic lifting jack, which has been improved by a power retracting device that screws down on the lifting nuts for a new stroke.

Scheduled for completion this December by Ford J. Twaits Co., Los Angeles, this job's cost-cutting and economical construction is doubly important because the hospital will be a non-profit organization.

spread footings, the main base slab serving as the first floor and as a casting bed for upper floors.

Footings were constructed fast, some of them being started about two weeks after C. G. Willis & Sons, Inc., Los Angeles, began earthwork under a subcontract. About 70,000 cubic yards of excavation was handled by Caterpillar D8 tractors and Cat No. 80 scrapers, and a Cat pusher. Most of the disposal areas were within the construction site, so that hauls were short and crews and equipment were able to keep work moving at a good pace.

A Warner & Swasey Gradall made the square cuts for all footings. The material excavated was a sandy gravel, and over-excavation and forming was generally required for each footing, some of which were as much as 14 feet deep.

### Base slab is casting bed

Neptune & Thomas, Pasadena, with structural engineering assistance from John K. Minasian, also of Pasadena, worked out a design that uses 22 lift slabs for various floors and roofs. The foundation of the hospital is on

### Simple forming

Forming was easy throughout the job, and costs of this work and of cleanup were slight. Footing pours were made with conventional shiplap panels, prefabricated and held in place by wales and tie bolts.

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For more facts, use Reader-Reply Card opposite page 18 and circle No. 311

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For more facts, use Reader-Reply Card opposite page 18 and circle No. 312

CONTRACTORS AND ENGINEERS





A large Master vibrator is used to consolidate material for the main slab, while a smaller Mall machine, back-ground, works on the joists.

A 6-column lift-slab starts upward. The cardboard forms, which give a honeycomb effect to the underside of the slab, make it possible for light, strong panels to be constructed. Jacks were placed atop the new square columns from a scaffold.



Forming for the sides of the 11½-inch-thick lifts slabs on the medical wing of the hospital was done by planing 2×12-inch lumber to the proper dimension, then facing the boards with combed plywood. Three such slabs were formed for lift-up purposes under the medical wing. Four 13-inch-thick slabs required for the nursing wing were formed in a similar manner with slightly wider lumber. The 22 lift slabs in the hospital will create a three-floor medical wing measuring 191×100 feet; a four-floor nursing wing, 196×42 feet; a single-floor psychiatric ward, 82×51 feet; and a single-floor utility building. The design of the building is such that another nursing wing may be added in the future.

#### Cardboard forms

Cardboard boxes, made by the Container Corp. of America and used to form the waffle effect in the slabs, permitted light, strong panels to be built that would cover a great area. The easily constructed waffle-type slab turned out on this job gives the effect of reinforced concrete beams both ways. The lift-up slabs were

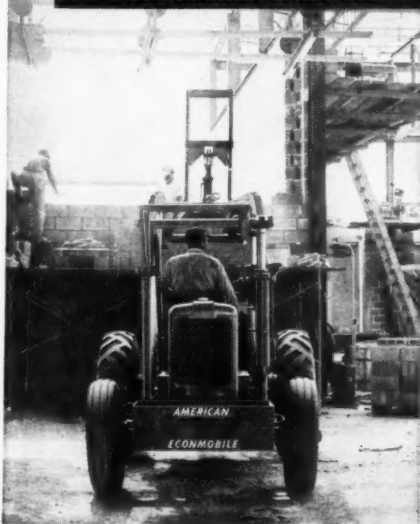
figured on a 36-inch module, which in effect, provides a double-joist system with 6-inch-thick joists and a minimum thickness of 3½ inches of concrete slab over the top of the boxes.

The boxes cost little and are easily handled. One of the first jobs they were used on was the 336,000-square-foot warehouse built for the Thrifty Drug Stores Co., Los Angeles, where their cost came to about 12 cents per square foot. The final cost on this job came to \$3.60 per square foot. The same methods, used on a 269,000-square-foot garage for Tishman Corp. in Los Angeles, brought the construction cost to \$2.50 per square foot. On this 967-car garage, the cost of lift-up construction amounted to 18 cents per square foot of building area.

The only disadvantage in using the paper-box forms is that they are affected by rain. The egg-crate reinforcement that goes into each box section is particularly vulnerable to damage. This posed no real problem for Twaits on the hospital job, because the firm used a sheet of waterproof Sisalkraft paper just under the reinforcement sections. Project Su-

(Continued on next page)

### clearance? the ECONMOBILE 600 LOADER has it!



The ECONMOBILE is the only loader that can lift as high as 22' (with auxiliary tower) and still get under an 8' clearance. That means the ECONMOBILE can work both inside and outside a building, and can easily get under most aerial obstructions.

The ECONMOBILE also offers a long reach—up to 6' from wheel to heel of the fork; and it has a 90% use factor with a wide range of attachments.

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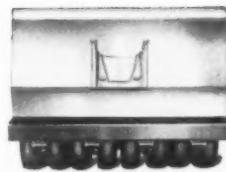
## DUO-PACTION

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- Steel and rubber rolls, operating alternately or in unison, produce aggregate base of higher density and greater stability than with either pneumatic or steel only.
- Non-conforming tire sizes and spacing of front and rear rolls prevent direct tracking... no increase in depth of grooves.
- Steel roll "irons out" ridges left by pneumatic rolls... no change of grade or surface level.
- Large diameter drive rolls, powered by International "300" UTILITY TRACTOR, work in softer materials, deeper lifts.
- Full-power steering... non-stop turn-arounds on 18 ft. roads and streets.
- Widest gross weight range... 6-19 tons.



Controlled Oscillation of gang roll assemblies, supplied by torsion spring deflection, provides higher loading on the ridges and high spots, leveling out compacted surface.

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The last slab to be poured—the roof slab—is given a rough finish by a Whiteman mechanical trowel. Thompson's water seal compound between the slabs permitted them to be separated easily from each other as lifts were made.

(Continued from preceding page)

perintendent C. C. DeArmond took no chances with the forms, covering whatever had been boxed in with canvas tarps whenever rain threatened.

The boxes arrived on the job pressed flat, and were set up together with the egg-crate reinforcement and waterproofing paper. Boxes for the medical wing were 30×30×8 inches, so that there was a minimum of 3½ inches of concrete slab placed above them. A like amount of slab went over the 30×30×9½ inch boxes used for slabs in the nursing wing.

The job of setting the boxes up for one of the larger pours—which measured 50×162 feet and encompassed 12 columns on 27-foot centers—required only a short time, but a great deal of coordination was needed on the part of the crew to set the boxes, get reinforcing steel placed accurately, and have concrete placed.

#### Slabs poured fast

Although more than the usual amount of care was needed to place concrete around the cardboard boxes—in comparison with placing concrete on steel or pan-type forms—Twaits set up a good rate of production on the job. Even the bigger slabs were formed and poured in practically two shifts. One 210-cubic-yard pour required only four hours.

After working out a well-coordinated placing schedule, in which the clearance of slabs, their compressive strength, and the time needed for installing materials in each slab was taken into account, Twaits stuck to it, completing this phase of the work in 41 days with a crew of about twelve men.

Concrete was hauled to the job in Challenge 6½-yard truck mixers that worked out of San Gabriel Ready Mixt Co.'s commercial plant. All concrete was placed either directly from the truck mixer, with the aid of chutes, or by two Lorain Moto-Cranes. Each of these cranes handled two Gar-Bro 1-yard buckets, swinging one to the pour while the other was being filled.

Concrete was strung along in thin lifts, and vibrated as soon as it was placed so that joists and other sec-

tions of the slab were completely filled. Two Mall electric stingers were used in the joists, and a larger Master electric vibrator was used in open portions of the form. All concrete in this type of slab must be vibrated, for it is impossible to stick a vibrator down against the form and hope to obtain any degree of consolidation. The cardboard boxes are not resistant to the jolt delivered by a modern vibrator.

As one slab was poured directly on the next, it was sprayed with Thompson's water seal. This made the slabs separate from each other easily as they were lifted. Dowel reinforcing steel was left sticking out of each slab so that the openings between slabs could be concreted after slabs had been lifted into place. This was done by placing a plywood form on the

underside of the slab and buggying concrete to the opening.

#### Slabs lifted easily

The lift-up slabs, which weigh as much as 425 tons, were lifted by a system of hydraulic jacks owned by the Vagtborg Lift Slab Corp., San Francisco and Los Angeles. The firm, a subcontractor on this part of the work, is one of the companies licensed to use the technique by U. S. Lift Slab Corp., which holds the patents.

The jacks were atop square steel columns for this lifting job. These 10½ inch square columns, rather than the 12-inch round columns which would have been needed to deliver equal strength, were developed for lift-slab work by Kaiser Steel Corp. Since Kaiser worked out a method of

## For Power that costs less to buy, run and maintain SPECIFY GM DETROIT DIESEL in All Your Construction Equipment

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Single Engines ... 30 to 300 H.P. Multiple Units ... Up to 893 H.P.

# DETROIT DIESEL

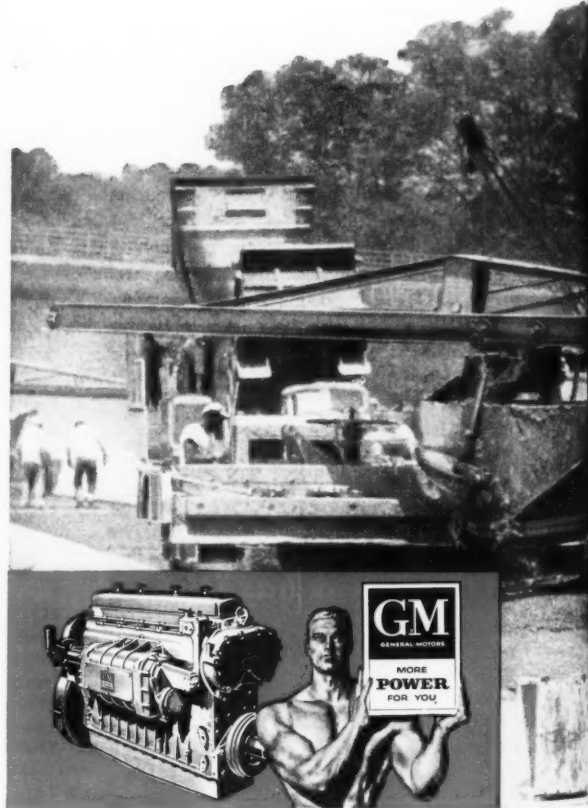
ENGINE DIVISION OF GENERAL MOTORS  
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Excavating Contractor Russell F. Davis of Lafayette, Indiana, put this GM Detroit Diesel-powered Northwest 25 in service in 1947, has spent only \$150 for repairs since. Now company owns three more excavators—all powered with quick-starting, fast-working GM Detroit Diesels.



"WE'VE STANDARDIZED ON GM DETROIT DIESEL Dependability, fast service, interchangeable parts—these are some of the reasons why Pennsylvania contractor, John Teeter & Sons, Inc., has standardized on GM Detroit Diesel power for crushers, pumps, generators and self-powered machinery."



rolling them from 12-inch round pipe, their use has expanded rapidly. Several fabricating outfits are also making the columns at the present time.

At each of the hydraulic jacks on each column are two sets of heavy-duty nuts, one of which acts as a safety device. The power retracting mechanism, which allows a jack to drop 3 inches for another lift cycle, cut retracting time to 15 seconds, speeding the job of lifting a slab into place. In one cast, a 17-foot lift on a six-column slab was made in an hour and fifteen minutes. Another large slab, weighing 420 tons and measuring 50 x 162 feet, was raised in slightly more than two hours. Because the hydraulic pumping capacity of the Denison pumps remains constant, it takes longer for 12 jacks to raise a

big slab than it does for six jacks to raise a smaller one.

After workmen had set the jacks, using a rolling dolly built of Patent scaffolding and an Essick hoist driven by a Wisconsin gasoline engine, slabs were raised into place. Lifts were made in two increments. The first lift took the slabs to the top of the first section of each column, between 15 and 20 feet above ground level, where they were tied off temporarily on heavily bolted steel plates that were fastened to the columns through drilled connections.

When the upper slabs had been temporarily tied off, the second floor slab was taken up and welded, while connectors fitting along the steel columns supported the heavy steel collars embedded in the slabs. The columns

were then extended, and the upper slabs lifted into place and permanently tied. Vagborg's experienced crew ordinarily handles 30,000 square feet of slab per week on this basis, and stays abreast of most concrete gangs.

#### Method helps economy

All the advantages of the lift-slab method were evident on the hospital job. It not only saved valuable man-hours for all trades, but also reduced overhead for the contractor, made it possible for the owner to take occupancy earlier, and cut time—and thus costs—of rental equipment.

On this job, as on others, the lift-slab technique made it possible for crews to work at maximum efficiency by permitting them to do most of

their work at ground elevation. In some cases, masonry materials can be placed on the slabs before they are lifted, saving hoisting time, money, and rehandling. Once a slab is lifted, it protects workmen from rain and forms a storage space for materials and equipment being used on the job.

The method has other points in its favor. Time can be saved in lining for walls at floor and ceiling, because these points can be chalked on one slab and transferred to the one above. Since the whole job is done at ground level, there is no danger from collapsing forms or falling objects. Forming and shoring costs are cut drastically, as evidenced by this job. The method also allows heating and cooling ducts, sprinkler systems, electrical conduits, and mechanical runs to be prefabricated or assembled on the floor and pulled into place.

#### Disadvantages of method slight

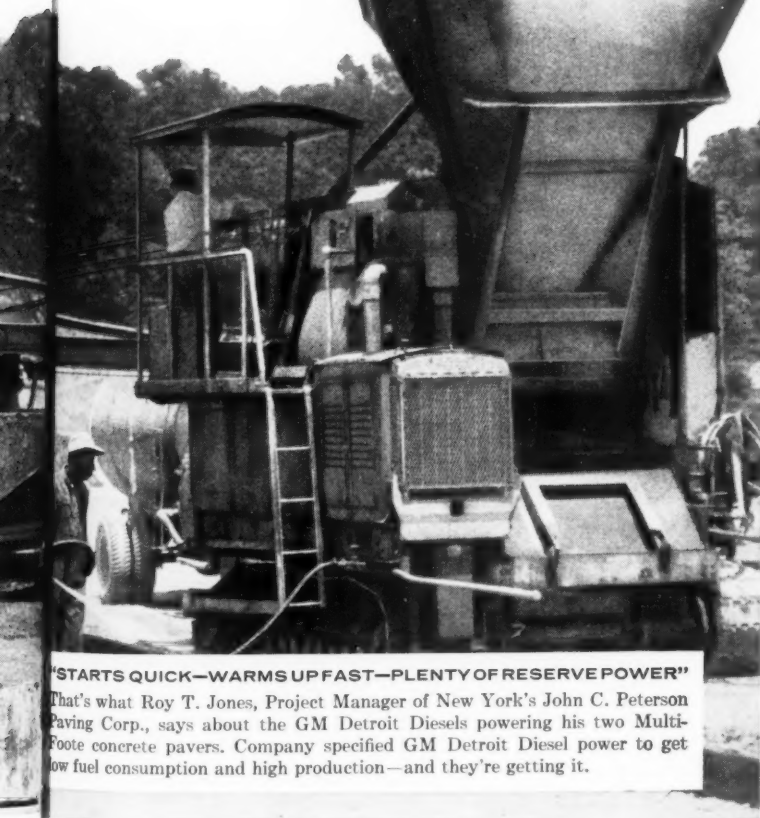
Weighed against these advantages, the drawbacks of the system are slight. Perhaps the most important is that it is not economical to use in constructing smaller buildings. Setup and mobilization costs for a one-slab job are just about the same as for a 100-slab structure. Special lifting equipment and trained personnel are required for the actual lifting process, but this problem is no longer serious, since more specialized contractors have become licensed to do this work.

Another disadvantage—if it can be called that—is that lift slab construction moves so fast that organizing and managing a job takes some skill. The traditional order of building construction is practically reversed. Designers have a complete plan ready when the ground slab is in place, and plumbers must complete all roughed-in underground plumbing first, because the floor slab—the first slab poured—will be permanently in place. Since it is a new system, there is still some tendency to avoid using it on the part of some contractors. But the evidence leaves no doubt that it is one of the most practical methods devised and in use for constructing large buildings today.

THE END

## and maintain SE ENGINES

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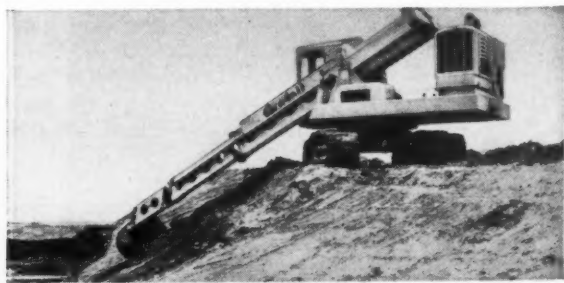
#### "STARTS QUICK—WARMES UP FAST—PLENTY OF RESERVE POWER"

That's what Roy T. Jones, Project Manager of New York's John C. Peterson Paving Corp., says about the GM Detroit Diesels powering his two Multi-Foot concrete pavers. Company specified GM Detroit Diesel power to get low fuel consumption and high production—and they're getting it.



#### CRUSHES 280 TONS ON 90¢ FOR FUEL

Minnesota gravel contractor P. O. Pederson switched from a 4-cylinder Diesel to a GM Detroit 2-cycle Diesel several years ago, has specified GM Detroit Diesel in two more crushers bought since then. Company reports GM Detroit Diesels start easy, work fast.



#### WINS \$1,143,835 JOB WITH GM DIESEL UNIT

This GM Detroit Diesel-powered Gradall's ability to do a faster job at less cost helped an Illinois contractor win a big contract in Oklahoma. In 400 days he cleared and grubbed 2,493,000 yards to widen and straighten a river and stabilize its banks.

For more facts, use Reader-Reply Card opposite page 18 and circle No. 315

### Parts and Service

As Near as  
Your Telephone



Wherever your contracts take you, you'll find General Motors Detroit Diesel distributors and dealers ready to give you fast service and quick delivery of low-cost factory-engineered parts day or night.

For 165 GM Detroit Diesel distributors and dealers blanket the nation—still more are located in Canada and overseas—to help you keep your GM Detroit Diesels running right.

And when you call you get action, for these distributors and dealers know the need for speed on construction jobs—completion dates don't wait.

Typical of this speed is the experience of a contractor in West Virginia. He needed an engine overhaul on a scraper. His Detroit Diesel distributor had his scraper back on the job in two hours—because he pulled the engine and replaced it with a rebuilt unit, then took the original engine back to his shop for overhaul.

Another contractor hit subsurface water on an excavation—and his distributor kept the contract going by delivering GM Detroit Diesel-powered Wellpoint pumps in less than half a day.

And when you put your GM Detroit Diesel in the hands of your distributor's or dealer's servicemen, you're putting it in the hands of experts.

For they're factory-trained, know all the latest maintenance and repair procedures.

And they use factory-engineered replacement parts—the same parts, built to the same rigid specifications as the parts used in building GM Detroit Diesel engines.

For full details on the parts and service behind your GM Detroit Diesel, call your local GM Detroit Diesel distributor or write direct.

#### Six-wheelers

■ The advantages said to result from the use of White Motor Co.'s six-wheel trucks are presented in a folder. On-the-job photos show the six-wheelers hauling cement block, asphalt, and bulk cement. The folder also details the double-channel frames and the tandem axles of the trucks. Specifications are included.

To obtain this folder write to The White Motor Co., 842 E. 79th St., Cleveland 1, Ohio, or use the Request Card at page 18. Circle No. 103.

#### Gates Engineering names new vice president

The new vice president of operations for Gates Engineering Co., Wilmington, Del., is Harry C. Burger. He will supervise the company's expanded milling and calendaring facilities.

## Avoid legal pitfalls

### Crediting payments

**THE PROBLEM:** Before a construction contract was made, the contractor did some preliminary work not covered by the contract. Later the owner gave the contractor a check for \$1,000 without specifying how it was to be credited. Did the contractor have a right to credit the payment against the charge for the preliminary work, instead of crediting it upon the contract price?

**THE ANSWER:** Yes. (Royal L. Blockob Construction Co. v. Trust Company of Illinois, 128 N. E. 2d 620, decided by the Appellate Court of Illinois, First District.)

The decision follows the rule generally recognized by the courts, that a debtor owing two or more separate debts to the same creditor, may require the creditor to credit a payment against any one of them. If he does not give any direction, the creditor may choose the account to be credited. An exception to the rule exists when a material dealer knows that money paid him by a contractor was paid to the latter by the owner of a structure against which the dealer has a lienable claim. In such a case, failure to credit the lienable account will ordinarily defeat the lien to the extent of the payment.

### Oral sewer contract with city was void

**THE PROBLEM:** An employee of a sewer contractor was killed when a ditch caved in. The right of the employee's widow and daughter to a workmen's compensation award against the city depended, under Missouri law, upon there being a written and signed contract between the city and the contractor. There was no written contract, but the mayor of the city had orally authorized the work. Did a valid contract exist?

**THE ANSWER:** No. (Grauf v. City of Salem, 283 S. W. 2d 14, decided by the Springfield, Mo., Court of Appeals.)

The court said that the fact that the city accepted the benefits of the contractor's work did not validate the agreement.

### Government's liability for damage by drainage

**THE PROBLEM:** While a contractor was installing a concrete water pipeline for a city, the line was damaged by drainage of rainfall from the hard-surfaced area of a nearby government air base, which had inadequate drainage facilities. Was the government liable under the federal Tort Claims Act (28 U. S. Code Annotated, sec 2671 and following sections) which makes the government liable to a limited extent for damages caused by negligence in its operations?

**THE ANSWER:** Yes. (United States v. Griffith, Gornall & Carman, Inc., 210 Fed. 2d 11, decided by the United States Court of Appeals, Tenth Circuit, approving a decision to the same effect by the United States District Court for Utah.)

The Court of Appeals said that the contracting company proved its right to an award of \$15,520.08 damages to cover the cost of repairing the damaged work, and a resulting expense of \$2,860 for time spent by the company's officers in connection with the repairs. But no allowance was made on a claim for loss of profits and interruption of the company's business, because the amount of the loss was uncertain. The court cited decisions of the United States Supreme Court to the effect that it is not

necessary that the amount of lost profits be precisely proved, but that an award cannot be based upon guesswork or estimates of witnesses not backed up by proof of facts supporting the estimates.

### Lessee held responsible for units lost in fire

**THE PROBLEM:** A front-end loader was leased under a contract requiring its return in the "same good mechanical condition, save and except the usual wear and depreciation as may be caused by reasonable use and wear". The machine was destroyed by an accidental fire. Did the loss fall upon the lessee?

**THE ANSWER:** Yes. (St. Paul Fire & Marine Insurance Co. v. Chas. H.

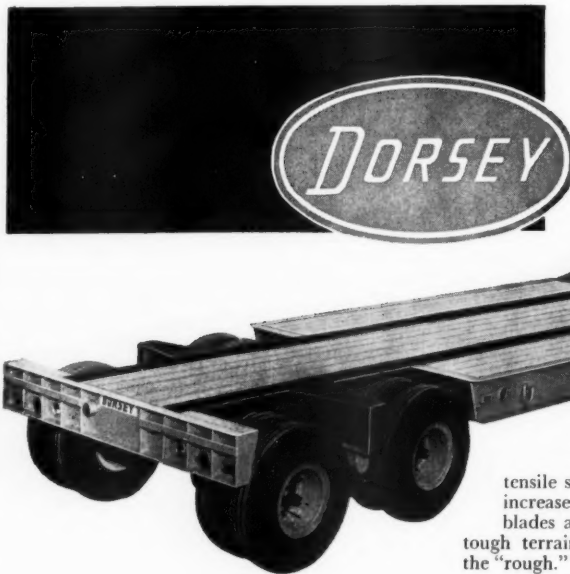
## Edited by A. L. H. STREET Attorney-at-Law

These brief extracts of court decisions may aid you. Local ordinances or state laws may alter conditions in your community. If in doubt consult your own attorney.

Lilly Co., 286 Pac. 2d 107, decided by the Washington Supreme Court.)

The insurance company, having paid the amount of the loss to the lessor, sued the lessee for reimbursement.

The judges of the Supreme Court were evenly divided in opinion, and judgment of the Superior Court, Seattle, in favor of the insurance



## LIGHTER-STRONGER DORSEY LOW BEDS

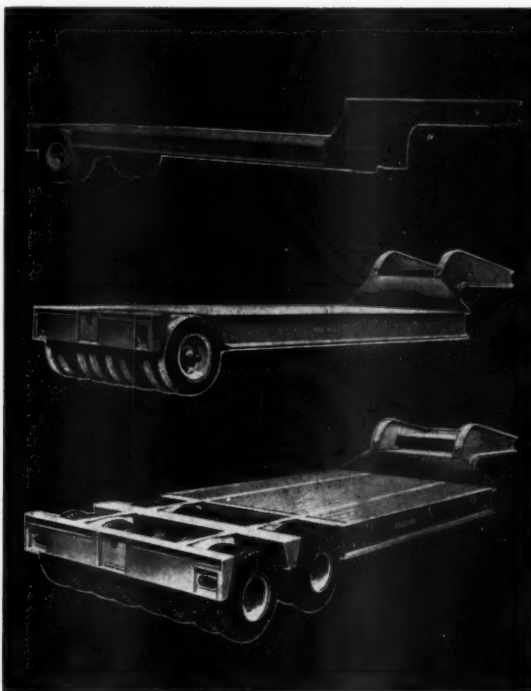
### NEW MODEL HTS 20 Ton Capacity

WEIGHS ONLY 8,250 POUNDS  
(also available in 15, 25, 30 and 35 ton capacities)

New Dorsey HTS Models are as much as a ton lighter in weight than other trailers of comparable capacity. High tensile steel main channels and close-spaced all welded cross members increase carrying capacity. Flat type gooseneck provides support for blades and other loads. Wheels in tandem "walk" on stub axles over tough terrain, for easy pulling—with load stability—on highways or in the "rough."

## THERE'S A DEPENDABLE DORSEY FOR EVERY TOUGH JOB . . .

On construction jobs all over the world Dorsey Low Beds have proven themselves dependable, easy-handling and efficient under the toughest conditions. The units illustrated are standard and are available for prompt delivery in capacities from 10 to 75 tons, while 100-ton trailers are built to order. For unusual requirements, utilize the experience of Dorsey engineers to design special equipment.



### MODEL "MK"

Light weight and highly maneuverable, this low-cost model comes in 10 and 15 ton capacities, semi and full trailers. The level deck is standard, but 6 or 9 inch drop deck may be specified at low additional cost.

### MODEL "M"

Semi and full trailers in 15, 20 and 25 ton capacities. Two trunnion tubular oscillating axles provide smooth, easy riding, absorb road shock and strain.

### MODEL "MT"

Capacities; 35, 40, 50, 60 and 75 tons in both semi and full trailers are standard, with as high as 100-ton capacity on special order. Eight steel spoke dual wheels mounted on four oscillating axles set in tandem on walking beams. New air actuated braking system without troublesome rods and connections.

Standard equipment on all low beds include: ICC lights and reflectors, directional signals, brakes, lashing D's, rear loading ledge, two coats prime and one coat finish paint.

**DORSEY TRAILERS**

**ELBA, ALABAMA**

For more facts, use Reader-Reply Card opposite page 18 and circle No. 316

CONTRACTORS AND ENGINEERS



company, was affirmed because there was not a majority in the Supreme Court favoring reversal.

The dissenting judges were of the opinion that the lessee's agreement to return the loader in good condition implied that it would not be destroyed. One of these judges said that although the appellate courts of the country do not agree on the liability of lessees of chattels in such cases, a majority favors nonliability.

In an Iowa case—Ford Paving Co. v. Elzy, 173 Iowa 38, 155 N. W. 161—a paving company had hired an asphalt plant and equipment and a roller under an agreement to return them in as good condition as when used. Two tar kettles were returned in damaged condition without any explanation as to how the damage

occurred. Because it was inferred that the company was to blame, it was held liable. But the opinion of the Iowa Supreme Court in this case seems to imply that the paving company was not an insurer against loss or damage not due to its fault.

But in 1914, the Oregon Supreme Court decided that a lessee who had agreed to return a shovel in the same condition as when he received it, except for ordinary wear and tear, was bound to stand the cost of repairs necessitated by an accident, even if he was not at fault. (Pacific Bridge Co. v. Riverside Rock Co., 70 Or. 337, 141 Pac. 751.)

### Public criticism of work does not libel contractor

**THE PROBLEM:** A superintendent of schools complained through the local newspapers that an addition to a high school was not completed within contract time. He attributed this to an inadequate working force, and stated that not a half-day's work had been done in the last 18 days. Was the contractor entitled to damages on the ground that his statements were libelous?

**THE ANSWER:** No. (Grande & Son, Inc. v. Chace, 129 N. E. 2d 898, decided by the Massachusetts Judicial Court.)

The court noted that the contractor was not charged with intentional delay nor with fraud or dishonesty. Nor did the mere assertion of delay in finishing the work necessarily imply bad management. "In the performance of a construction contract, such as this, which was to run substantially for a year, labor and material difficulties might and frequently would be likely to intervene. \* \* \* Readers of the published articles would be cognizant of such possibility or probability."

### Liability on bid bond

**THE PROBLEM:** The lowest bidder on a construction job in a Minnesota school district was unable to give a performance bond when the contract was awarded to him, although his bid contemplated that one would be given. The contract was awarded to the next lowest bidder. (1) Were the lowest bidder and his surety on the bid bond liable in damages to the school district for the difference between the two bids? (2) Was the defaulting bidder liable to the surety for indemnity against liability on the bid bond, plus attorneys' fees for defending the school district's suit?

**THE ANSWERS:** (1) Yes. (2) Yes. (Independent School District No. 24 v. Weinmann, 68 N. W. 2d 248, decided by the Minnesota Supreme Court.)

### Contractor must warn men of existing job hazards

**THE PROBLEM:** A general contractor who had undertaken subdivision of a tract, subtlet the laying of a sewer line across a street. Both the general contractor and the subcontractor knew that there was a gasoline pipeline under the street. The trencher operator employed by the subcontractor was not warned of the line and



**TRUCK LOADING AS IT GOES**, this "Baby Digger" solves the spoil removal problem as it sneaks alongside a chain link fence while digging an 18" x 36" utility trench. Just another example of Cleveland's outstanding ability to dig more trench . . . in more places . . . at less cost.



**BACKFILLING 50 FEET PER MINUTE** this Cleveland "190" Backfiller did a fast, clean, economical job on the recently completed Saskatchewan Power Company pipeline from Prince Albert to Coleville, Sask. Trench was 5½ feet deep and sloped from 20 inches wide at bottom to 6 feet wide at ground surface. The line is 219 miles long, not counting expansion loops. The unique one-man operation of the "190" saved many man-hours on this project for Majestic Contractors, Ltd., of Edmonton, Alberta.



**DIG . . . DODGE . . . DIG** was the order of the day as this Cleveland cut trench for utility mains and service lines on a new housing project in the Pittsburgh area. The Cleveland's easy maneuverability—enabling it to dodge around numerous obstructions in the rough ungraded fill—was a big factor in getting the utility lines in on schedule while many other construction jobs in the development were in progress. Your local distributor will gladly show you how Cleveland's will help you to dig more trench . . . in more places . . . at less cost.

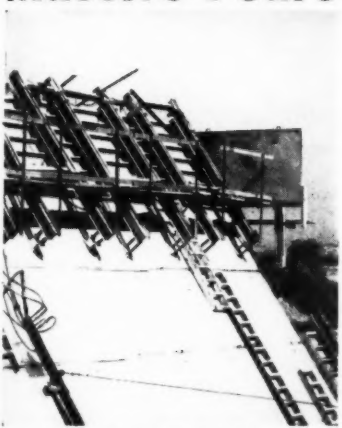
**THE CLEVELAND TRENCHER COMPANY • 20100 St. Clair Ave., Cleveland 17, Ohio**



# CLEVELAND

For more facts, use Reader-Reply Card opposite page 18 and circle No. 318

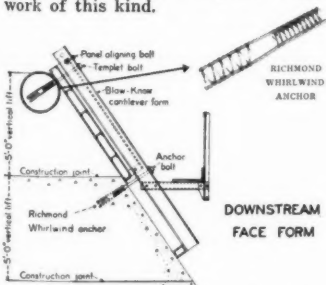
## Massive Pours



Merritt-Chapman & Scott and The Savin Construction Corp., contractors, used 55,800 Richmond Whirlwind Anchors without slip or spill in this vast dam construction at American River, Folsom, California.

### Economies with Richmond Whirlwind Anchor

In dam construction like the above, considerable speed and economy are to be gained by pouring successive monoliths in 5 ft. lifts into steel cantilevered forms. Success of this money-saving method depends, however, on one-point form anchorage that will positively withstand massive overhead pours and loads imposed from all directions. Richmond's Whirlwind anchor was designed especially to prevent slip for rugged work of this kind.



These Richmond anchors are mounted on the form before each monolith is started. Installation is easy. The Whirlwind is made with double coils, one coil takes the form bolt, the other supplies added anchorage to prevent slip in concrete during its low early strength period. There is no spalling. Richmond's development of these special anchors has been in large part responsible for the constantly increasing popularity of this fast, more economical, anchorage and pouring method.

For more information, or a copy of the Richmond Handbook of tying devices, anchorages and accessories for concrete construction, write: RICHMOND SCREW ANCHOR COMPANY, INC., 816 Liberty Ave., Brooklyn 8, N. Y. or 315 S. 4th St., St. Joseph, Mo.



For more facts, circle No. 317

(Continued from preceding page)

was killed in an explosion when the machine punctured the gasoline line. Could the general contractor be held liable on the theory that it was his obligation to have given warning.

THE ANSWER: Yes. (Raich v. Aldon Construction Co., 276 Pac. 2d 822, decided by the California District Court of Appeal, Second District.)

### Uphold conspiracy charge

THE PROBLEM: The law forbids the statement of two distinct offenses in a single count of an indictment. An indictment against several persons charged, in effect, first, that they unlawfully agreed to obstruct the ad-

ministration of New Jersey public-bidding laws by causing a city to enter into contracts for public work and the furnishing of supplies without advertising for bids, and second, that they agreed to defraud and cheat the city by making fraudulent contracts at grossly excessive prices without advertising for bids. Was the indictment invalid as stating two distinct offenses in one count?

THE ANSWER: No. (State of New Jersey v. Spence, 115 Atl. 2d 585, decided by the Appellate Division, Superior Court of New Jersey.)

### Engineers are covered under federal labor law

THE PROBLEM: An engineering com-

pany's general business was not of such nature in itself as to involve interstate commerce. But the firm did provide plans, specifications, and supervision for a client who paved streets and improved an interurban railroad that carried interstate commerce. The client had also enlarged a plant that carried power across state lines. Were the engineering company's employees who were engaged on those projects covered by the wage and hour provisions of the Federal Fair Labor Standards Act?

THE ANSWER: Yes. (Mitchell v. Brown, 224 Fed. 2d 359, decided by the United States Court of Appeals, Eighth Circuit.)

Deciding that resident engineers assigned to the projects by the com-

pany, as well as employees who prepared the plans and specifications, were covered by the federal law, the court said: "Although the resident engineer did not remain at the project at all times, . . . it was his duty to inspect all incoming materials to determine if they measured up to specifications; to inspect work completed by the contractor to ascertain if it conformed to the plans and specifications; and to make progress reports to the owner and recommend payment of moneys earned under the contract if the contractor's work was satisfactory. The inference is fairly deducible that the work of the resident engineer was a vital factor affecting the progress of the construction project. Further, although the stipulation recites that the resident engineer has no right or duty to direct or control the contractor in his work the fact remains that completion of a project depends in no small way upon the services rendered by" the engineering company's employees.

## How to switch "rigs" on the go... get "four-for-one" machine utility!

From the seat and on-the-go you instantly get any material-moving action you need with an International® Drott® Four-In-One!

You'll be cascading dirt in dozer position and suddenly need carry-type scraper action. Touch the "machine selector" lever with finger-tip ease, and you have it—to grade, strip, or spread with accurate clam lip control!

Touch! again, for Skid-Shovel position. And with exclusive Drott triple-power, pry-over-shoe break-out action, you can be tearing up and loading stuff as tough as concrete pavement—often where even a power shovel fears to tread!

Touch! once more—and a fast-working clamshell can be gulping aggregate in a space barely big enough to contain your outfit! And giving you a "hopper-high" dumping reach, 30 inches above ordinary roll-forward buckets!

Prove to yourself a Four-In-One will save uncounted hours of changeover time—give 4-machine utility for one moderate investment. Now available in 3 sizes: 1-yard to 2¼-yard capacity, all with the built-in protection of exclusive, shock-swallowing Hydro-Spring. Ask your International Drott Distributor for a Four-In-One demonstration!



**Material-Loosening Scarifier Attachment!** It's simple to install this scarifier attachment, to speed straight-forward bucket loading. The third or extra valve (which is standard equipment on all Drott Skid-Shovels) is used in this operation. This hydraulic-controlled scarifier has deep penetration, and strength for hard materials. See and try it!



International Harvester Company, Chicago 1, Illinois  
Drott Manufacturing Corp., Milwaukee 8, Wis.

**INTERNATIONAL®**  
**DROTT**

### Contractor not liable for sub's negligence

THE PROBLEM: A pipeline contractor sublet part of the work. In disposing of rubbish, the subcontractor negligently caused fire to spread to land adjacent to the right-of-way. Was the prime contractor liable to the land owner for the damage?

THE ANSWER: No. (Weeks v. Texas-Illinois Gas Pipeline Co., 276 S. W. 2d 321, decided by the Texas Court of Civil Appeals, Galveston.)

The decision is in line with rules of law recognized by the courts generally, to the effect that an owner of property is not liable for neglect of his contractor in doing work, and a general contractor is not liable for neglect of a subcontractor, where the damage caused does not arise out of a risk that is inherent in the nature of the work.

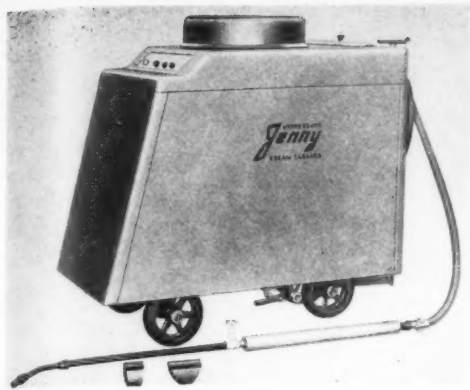
### Crane owner is liable for operator's fault

THE PROBLEM: The plaintiff's firm hired from the defendant a crane and its operators to assist in drilling test holes. The plaintiff exercised no control over the operators other than telling them when and where to spot the crane. Disregarding the plaintiff's warning about overhead, uninsulated, high-tension electric wires, an operator, in moving the crane to a new spot for drilling, caused it to contact the wire. The plaintiff was injured as a result. Was the defendant liable?

THE ANSWER: Yes. (Agostini v. W. J. Halloran Co., 111 Atl. 2d 537, decided by the Rhode Island Supreme Court.)

The decision was influenced by the fact that plaintiff and his firm had no right to control the operation of the crane. The court said that in Rhode Island—as in most other states—"the right of control over a borrowed employee is determinative of the question whether he is the servant of the lending employer or of the borrowing employer."





A portable model, the 1250-G, of the new Hypressure Jenny steam cleaners.

### New steam-cleaner series includes eleven models

■ A new Hypressure Jenny steam cleaner has been announced by the Homestead Valve Mfg. Co. Known as the Series 1250, it is available in 11 different portable or stationary models with a choice of electric or gasoline engines.

Features of the cleaner include a new slow-speed positive-displacement pump, a minimum discharge rate of 120 gph at any pressure, and a contamination-proof water system.

A remote-control setup enables the operator to start or stop the cleaner from the cleaning gun, even though he may be 100 feet or more from the unit.

For further information write to the Homestead Valve Mfg. Co., Box 348, Coraopolis, Pa., or use the Request Card at page 18. Circle No. 25.

### Up to twelve re-uses with new form coating

■ Development of a new protective finish for plywood forms used in masonry construction has been announced by L. Sonneborn Sons, Inc. The finish is said to reduce form maintenance costs and to expedite handling.

Called Form-Saver, the new finish is a blend of synthetic resins in fast-evaporating solvents. It is free of grease, wax, oil, shellac, or varnish, according to the manufacturer.

The advantage of this formulation, the company reports, is that it permits clean, smooth stripping of the forms with no pitting of the concrete surface or transference of raised grain from the forms to the masonry. Specifically, Form-Saver is said to protect and preserve plywood forms against deterioration, materially reduce rubbing costs by preventing grain raising, cut the cost of painting by as much as 25 per cent because it leaves the concrete surface smooth and free of oil stains, and reduce investment in forms because it allows forms to be used over and over again.

Form-Saver is brushed on or, when the number of forms involved warrants it, applied by dipping. Field tests show that eight to twelve re-uses of a form are possible before recoating is necessary.

For further information write to L. Sonneborn Sons, Inc., 404 Fourth Ave., New York 16, N. Y., or use the Request Card at page 18. Circle No. 136.

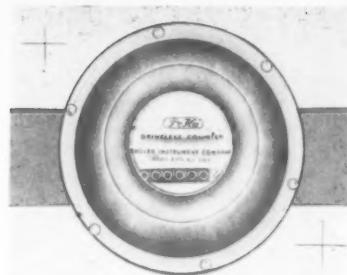
For more facts, circle No. 320

### New hubodometer dial always remains upright

■ New vented hubodometers which can be attached to trailer hub caps using oil seal or grease packing have been introduced by the Engler Instrument Co.

The new Engler Pe Ka driveless mileage counter is easy to read because the figures remain upright regardless of wheel position. The instrument is enclosed within a triple-sealed self-contained case, without any outside drive shaft.

For further information write to the Engler Instrument Co., 250 Culver



The Pe Ka driveless mileage counter has no outside drive shaft.

Ave., Jersey City 5, N. J., or use the card at page 18. Circle No. 109.



### 'Faster From Foster' meant plenty on this extra-tough pile driving job

This contractor was driving piles through silty material made soft by a heavy, rainy season. And he had to work in a narrow, twisting, busy street. No space for job-site storage, and as always, a heavy cost penalty for time lost waiting for late material. By renting 27 to 33-ft. lengths of steel-sheet piling from L. B. Foster Company, he got deliveries as the piling was needed—delivered by Foster trucks over routes planned during light traffic periods. All the headaches that could have been the contractor's were eliminated by using the Foster Piling Rental Plan, and the pile driving was completed on schedule.

Foster Piling Rental Service is complete—for all types of steel-sheet piling (and lightweight piling). You get the right type, the exact section, the exact length . . . when you need it . . . and on the low fixed cost of our rental plan. Ask your nearest Foster office for details and prices on your temporary piling needs, and see for yourself the savings in the Foster Piling Rental Plan.

**L.B. FOSTER** co. PITTSBURGH 30, NEW YORK 7, CHICAGO 4, HOUSTON 2, ATLANTA 8, LOS ANGELES 5

**"FASTER FROM FOSTER"**  
Steel-Sheet Piling, Pipe for Piling  
H-Bearing Pile, Lightweight Piling—  
Rails, Pipe & Fabrication



The Page Model 721 walking dragline has a 125-foot boom and a 7-cubic-yard automatic bucket.

### Announce new models of walking dragline

■ The new line of Page walking draglines, in capacities from 5 to 15 cubic yards, introduces an entirely new concept in dragline design and power, according to the manufacturer. The single-deck construction of the three new draglines is said to provide greater mobility; faster, lower-cost erection; and reduced shipping costs, while a unique V-type horizontal diesel engine designed specifically for dragline operation powers the rigs.

These draglines are fitted with booms supported by means of a Becket Staff and cables which provide support for the boom at three equally spaced points along its length. This

produces a rigid, trussed boom, greatly increasing the over-all strength of the dragline's superstructure, the company reports. Because the boom is rigidly supported (while still free to move in any direction), it becomes, for all practical purposes a continuous member with the superstructure.

Bending stresses are reduced considerably and boom whip is virtually eliminated with this design, Page engineers state. The upper portion of the Becket Staff removes sag from the main boom support lines, thus reducing the boom point deflection 75 per cent.

In designing an engine for its new line of draglines, the Page Engineering Co. has provided greatly increased horsepower without increasing over-all size or operating speed of the unit. Basically, the design consists of two banks of horizontal cylinders, mounted one above the other. The connecting rods of the opposing upper and lower cylinders are connected to the same crankshaft journal, reportedly providing smoother power strokes, greater power, longer life and maximum efficiency.

The centralized lubricating system of the Page diesel is said to assure positive and continuous filtered lubrication of all working parts. Major working parts are completely accessible for inspection or maintenance.

For further information write to the Page Engineering Co., Clearing Post Office, Chicago 38, Ill., or use the Request Card at page 18. Circle No. 155.

### Protective clothing

■ The complete line of Goodrich industrial clothing is featured in a catalog available from the company. Raincoats, jacket and bib-type overalls, hats, aprons, and gloves made of Koroseal are shown. This clothing is said to withstand oils, grease, most acids, alkalies, caustics, scuffing, and scraping. Rubber raincoats and work suits with vulcanized seams are reinforced at all points of stress, the catalog states. Oil-proof and acid-resistant rubber gloves have been redesigned to provide larger fingers and a snug fit at the wrist.

To obtain this catalog write to B. F. Goodrich Co., 500 S. Main St., Akron, Ohio, or use the Request Card at page 18. Circle No. 97.

### Line of trailers

■ The Talbert line of low-bed, tilt and flat-deck trailers, is covered in a catalog from the firm. According to the specification table, the trailers have a capacity from 10 to 100 tons. Details are given on spring, three-axle, and trunnion-suspension models. The step-by-step loading and unloading of the trailers is shown. Various models are illustrated.

To obtain this catalog write to Talbert Trailers, Inc., 7950 W. 47th St., Lyons, Ill., or use the Request Card at page 18. Circle No. 61.



## COUNT ON YOUR WICKWIRE ROPE DISTRIBUTOR FOR ENGINEERING ASSISTANCE

When it's a question of wire rope, the place to go is to your Wickwire Rope distributor. He knows your requirements. He knows wire rope and how it can be used to best advantage. In addition, he can provide you with this important extra—the technical assistance of Wickwire Sales Engineers. With the additional help of these capable specialists, he can give you expert, practical advice on even the toughest wire rope problems.

Your Wickwire Rope distributor is a good man to know. He's quality people handling quality products. Buy your wire rope and wire rope slings from him. You'll find that the many valuable services he offers far outweigh any apparent price advantage you might gain by buying direct.



A PRODUCT OF THE COLORADO FUEL AND IRON CORPORATION

For more facts, use Reader-Reply Card opposite page 18 and circle No. 321

3150



## Ten wheels oscillate on rubber-tire roller

■ A self-propelled, 11-wheel, pneumatic roller has been introduced by the W. E. Grace Mfg. Co. Powered by a Continental 6-cylinder 48-hp engine and featuring brakes on 10 wheels, the new machine is said to have a large capacity for ballast without permitting the roller to become top-heavy.

Oscillation is provided on 10 wheels to give even compaction and to develop soft spots in the surface that would otherwise be passed over. All tires can be changed without disturbing other tires. The six wheels at the engine end are drive wheels. Differential action is provided on each set of outside driving wheels, and the center pair is driven directly.

Four speeds forward and four reverse are provided on the new roller, with speeds ranging from 3 to 15 mph. Hydraulic steering is also provided.

For further information write to the W. E. Grace Mfg. Co., 6003 S. Lamar St., Dallas, Texas, or use the Request Card at page 18. Circle No. 165.

## Galion names manager

The new midwest regional sales manager for the Galion Allsteel Body Co., Galion, Ohio, is Joseph E. Jack. He will supervise the sale of Galion dump bodies, hoists, and Load-evator hydraulic end-loaders in Minnesota, Wisconsin, Illinois, Michigan, Indiana, Ohio, West Virginia, and western Pennsylvania.

## Mobile map rack useful in field drafting office

■ A lightweight mobile map rack on double ball-bearing rubber-tire casters is announced by the Ross-Martin Co. The manufacturer states the rack is equally useful in engineering offices and in field drafting offices.

Constructed of welded angle iron, sheet metal, and steel rods, the Model V-80 is approximately 4 feet long and 1½ feet wide. It will accommodate 80 rolled maps or plans of any size.

Metal-end telescope tubes can be used in pairs for dustproof filing or singly as open-end containers.

For further information write to the Ross-Martin Co., P. O. Box 800, Tulsa 1, Okla., or use the Request Card at page 18. Circle No. 113.



Up to 80 maps or plans of any size may be stored in the Ross-Martin Model V-80 mobile map rack.



American Planter Co.'s Model 1300 aluminum conveyor.

## Lightweight conveyor does man-size job

■ The American Planter Co. has announced the Model 1300 aluminum conveyor, a lightweight but strong

loader for transporting bags of cement, building materials, and other supplies from one level to another.

Smooth operation is said to be a feature of the conveyor, which is operated either by electric motor or gasoline engine. Positive action, with no slippage at steep angles, is reported by the manufacturer. The 16-foot sectional conveyor is easily transported in a truck or carried to upper floors for operation.

Sealed gears, ball bearings, a reversing switch, and an emergency switch are standard equipment. The

length may be varied by inserting or removing 4 or 8-foot sections.

For further information write to the American Planter Co., Burr Oak, Mich., or use the Request Card at page 18. Circle No. 147.

## Manager for David White

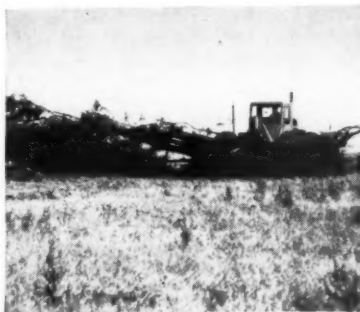
A. F. Waldenburg has been appointed general sales manager for the David White Co., Milwaukee, Wis., manufacturer of photographic equipment and precision optical and engineering instruments.



# Pictures of a tractor in a hurry!

On this road-widening job near Denison, Iowa, a grove of 60 ft. trees ranging from 10 to 15 inches in diameter had to be removed. Tournatractor did the entire job alone. First it dozed dirt from around the base of each tree to cut surface roots. Then, with dozer blade raised near maximum 54 inches, Tournatractor pushed trees

over. Complete uprooting task averaged 3 to 4 minutes per tree. Said the tractor operator, Elmer Schwarz, "This rig did a wonderful job in tree removing!" Its instant-shift transmission kept maximum "push" on the tree at all times . . . quick-shift into high-speed reverse let unit move away quickly from falling trees.



## Speeds clean-up, push-loading, & pulling

After uprooting trees, Tournatractor pushed them 300 ft. for disposal in a field. Push took 2½ minutes; return took about 40 seconds. "Tournatractor did one job fast and was ready immediately for another," comments operator Schwarz. Other assignments included push-loading scrapers, pulling rollers, and handling other important tractor work.



## On 40 ft. push, dozes 115 yds. hourly

When trees were removed, Tournatractor dozed in material from 50 ft. on both sides of the road to raise grade 2 ft. and to cut down banks prior to major scraper dirtmoving. Loads averaged 2½ to 3 pay yds. per push. On 80 ft. cycles, push, spread, and return took 1.3 minutes. Big low-pressure tires helped compact material as it was spread on the run.



## Travels job-to-job at 19 mph

Crawford County Hwy. Dept. owners, report Tournatractor goes virtually anywhere at speeds to 19 mph. Emergency jobs 5 miles away can be reached in about 20 minutes. As Job Supt. Leonard Hassett summarizes, "One of Tournatractor's advantages is that it can move quickly and efficiently." Let us demonstrate this speed advantage on your job. Write for details.

Tournatractor—Trademark Reg. U.S. Pat. Off. T-823-P-b



**LeTourneau-WESTINGHOUSE Company**  
Peoria, Illinois

A Subsidiary of Westinghouse Air Brake Company

For more facts use Reader-Reply Card opposite page 18 and circle No. 322

**distributor  
doings**

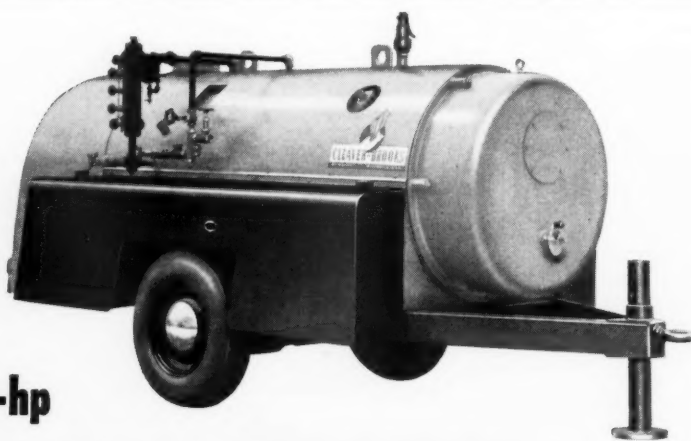
Various lines of construction machinery are exhibited in Municipal's showroom. A Schramm 200 air compressor, an Aeroil vapor steam cleaner, an Ingram 5 to 8-ton roller, and a Four Wheel Drive dump truck are kept in this area.

C&E Staff Photos



## Dealer builds success on service to customers

**New!**



**Cleaver-Brooks 50-hp**

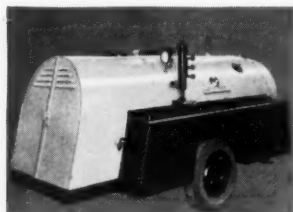
## **PS-50 PORTABLE STEAMER** **twice the steam and work capacity!**

### **Job-test this husky heater NOW!**

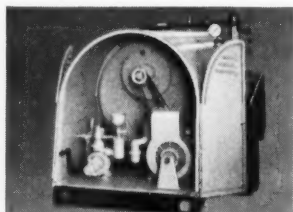
If you've ever owned or operated a Cleaver-Brooks 2- or 3-car heater — you *know* Cleaver-Brooks' work capacity! *That's why this new rig — with twice the capacity, offers more value than ever before.*

Surveys among contractors, municipalities, state and county highway departments prove the need for the new PS-50. They show this extra capacity is essential to economically handle scores of extra jobs constantly added to yearly work schedules.

The PS-50 PORTABLE STEAMER is the huskiest ever offered in its price range. It has the same high-quality design advantages of America's most modern boilers: quick steaming from a cold start . . . delivers 1725 lbs. of dry steam per hour . . . has proved economy of famous four-pass, forced-draft construction. Fully equipped — ready to GO!



**TOWS ANYWHERE WHEELS CAN ROLL** — Fender tanks carry 45 gals. water, 45 gals. fuel-oil, 8 gals. gasoline. Completely insulated, weatherproof. Attractively painted black and orange. Size: 13'-0" long, 5'-3 1/2" wide, 6'-0" high overall.



**FRONT END OPENS WIDE** — More room for components. Greater ventilation means cooler running engine . . . more operating convenience. Removal of 6 bolts opens rear head for fast cleaning. ASME code constructed.

**JOB-TEST THE PS-50 PORTABLE STEAMER NOW . . . write or phone for illustrated catalog.**

A product of Cleaver-Brooks Company, Dept. F, 396 E. Keefe Ave., Milwaukee 12, Wisconsin



**TWENTY-FIVE YEARS OF LEADERSHIP BY THE ORIGINATORS OF THE SELF-CONTAINED BOILER**

For more facts, use Reader-Reply Card opposite page 18 and circle No. 323

By combining all the ingredients for a successful business—hard work, long hours, executive ability of the officers, and a deferential attitude toward customers—two men with foresight built the Municipal Machinery Co., Inc., Coram, Long Island, into a thriving dealership with wide potentialities. The fact that it is the only dealer in Suffolk County, N. Y., the most eastern county in Long Island, and is located approximately at the geographical center of the Island, are certainly favorable business factors.

The suburban growth of Long Island during the past decade has more than doubled and is still on the upswing, indicating that more highways and streets will have to be built and maintained. Building developments for housing and industry, calling for many municipal projects, are reflected in the economic growth of the firm.

#### **Built with basic idea**

Ever since they started the business, both Kenneth Rhodes, president, and H. M. Brush, vice president, have felt that a happy, satisfied customer is a steady one that can be counted on for repeat business. This basic philosophy is still paying dividends. The two founders, realizing that nothing can substitute for personal contact with the customers, take time out to visit them, listen to their grievances, and discuss ways Municipal can be of further service to them. Practicing this philosophy has been both time-consuming and rough, calling for a great deal of diplomacy, but it has always been fruitful.

Formed in 1940, the firm acquired 24 acres of land with a 600-foot front on State Route 25, just east of Coram. Here they erected a building which now houses the offices, showroom, and the basement parts room. Other buildings were later erected on the property for the service department and for stock storage.

Personnel at that time totaled six, including Rhodes and Brush. Equipment accounts at the outset were few, consisting of Municipal Supply Co. sweepers, Temple stone and chip spreaders, Aeroil torches and heating kettles, Wickwire cable, and Flink spreaders.

Still maintaining its original accounts, Municipal has also added others through the years. Seaman-Andwall, Aeroil Products, Birmingham Mfg. Co., Flink, Schramm, Har-



**HEATING** — tank-cars, bituminous materials, asphalt, oil, aggregate, jacketed lines, water for masonry, heavy fuel oil.



**THAWING** — culverts, water mains, pipe lines, gravel, shot holes in frozen ground.



**STEAM SUPPLY** — for pile driving, soil sterilization, aggregate dryers, steam atomizing burners.



**CLEANING** — construction equipment, buildings and structures, de-vaporizing fuel tanks, and the like.



**Varied lines of equipment, thorough personal service keep customers returning to Long Island distributor**

The parts room, located in the basement of Municipal Machinery Co.'s main building, stocks hard-to-get items in order to prevent delay in filling a customer's order. Edward Wagner manages this phase of the company's operations.



nischfeger, Hendrix, Jackson, N. P. Nelson Iron Works, Owen Bucket, and Haiss are among the 29 lines Municipal now carries.

#### Company growth

The present organization numbers fifteen—eight salesmen, four men in maintenance and service, and three administrators. Since it is approximately 60 miles east of New York City, Municipal covers an area including all of Long Island, New York City, and Westchester County.

The salesman and a factory-trained service man, using one of the company's two service trucks, visit the customer when a new piece of equipment is delivered. The equipment is serviced upon delivery, and the service man stays until the customer is thoroughly familiar with the operation of the unit. A crane, for example, has a service man assigned to it for a minimum of three days to make sure that the rig is working smoothly and that the operator understands how it runs.

This personal attention tends to build good will between customer and distributor. If a customer becomes dissatisfied for any reason, prompt attention is given to his problem. That customers of Municipal know and appreciate this feature of the company is exhibited by the volume of repeat business the dealer does.

The sales force keeps in constant touch with its customers to learn first-hand of any service that is required. Heading the sales organization is Don Kempster, the sales and office manager, who joined Municipal as office manager in 1946, after serving 3½ years in the army. Prior to that, Kempster attended Hartwick College in Oneonta, N. Y., where he majored in business science. He is a native Long Islander, born and raised in Port Jefferson. In 1955, he doubled as sales manager while still acting as office manager.

The convenience of having spare parts maintained in the basement room has added to the company's success. Here the parts manager, Edward Wagner, maintains a continuous inventory of required parts. Spare parts, generally hard to get, are stocked in abundance to eliminate any delay in filling customers' needs.

Both Kenneth Rhodes and H. M. Brush are native Long Islanders. They

(Continued on following page)

Big rubber tires of C Tournapull provide traction for full loads in the poor footing.



**How J. S. Equipment Company moved 200 pay yds. of ripped shale per hr.**

**in poor traction**

Over 220,000 yds. of hard shale on a 45-acre section of Hillcrest Estates subdivision in Vallejo, Calif., had to be ripped to load. But when ripped, the shale became slippery footing.

The job included leveling land for 160 new housing sites, cutting and fine-grading streets and driveways, filling around buildings and spreading topsoil. Terrain was rolling; 40' of a hill had to be cut to level in one section.

2 rubber-tired C Tournapulls and 3 D Tournapulls handled 100% of heavy earthmoving... ahead of schedule.

Other equipment on the job included 3 crawler dozers, a crawler pusher, a ripper, 2 sheepsfoot rollers, 2 motor graders (one of them an Adams 610).

#### "C's" average 200 pay yds.

Despite tough going, the "C's" averaged 20 trips per 50-min. hour... carried 10 pay yds. each trip over the 800' cycle. Production... 200 pay yds. per hr. per machine.

"C's" were push-loaded by a D8 over a 100' loading distance in 39 seconds. Total cycle time: 2 min., 25 sec.

Superintendent Al Bannon reports the 2 "C's" produced 4,000 yds. in 9 hrs.

*NEW improved 18-yard heaped capacity Fullpak "C" will give you faster, bigger loads than shown in this job report. New lower, wider bowl packs in load to back corners, with live, boiling action, heaps quickly for big, low-void pay-load. Get details now.*

#### "D's" move 5 yds. per trip

3 D Tournapulls did clean-up work. They handled light cuts in grading streets, cleaned up and filled around houses, did the fine grading and spread topsoil. On filling and grading an area where houses would be built, the "D's" hauled 5 pay yds. per trip on one-way hauls up to 1200' one way. "D's" were used for production when not needed on other work assignments.

#### Maintenance is easy

Bannon rates mechanical efficiency of Tournapulls at better than 90% and says they are much easier to maintain than other equipment.

"I like the Tournapulls because you can work them in all kinds of weather. The short turn radius helps, too," Superintendent Bannon says.

From Operator Babe Marsh: "They're really a nice operating machine. Easy to steer—very maneuverable."

Next time you have a job that looks like "tough going", ask us for facts to show how rubber-tired Tournapulls can give you more pay yds. per load... and more loads per hour.



D Tournapulls spread on the run, were used on production hauling after completion of precision grading and clean-up work. Tournapull—Trademark Reg. U.S. Pat. Off. PDP-913-BB



**LeTourneau-WESTINGHOUSE Company**  
Peoria, Illinois

A Subsidiary of Westinghouse Air Brake Company  
For more facts, use Reader-Reply Card opposite page 18 and circle No. 324

## distributor doings

(Continued from preceding page)

foresaw the future expansion of the Island and the need for a dealer in this eastern section.

Ken Rhodes was born in Central Islip and attended schools there. For many years he had an automobile agency before he became a clerk for the Suffolk County Board of Supervisors. Brush, from Smithtown, had been affiliated with his father in a trucking concern. He left the trucking business to become a master mechanic and heavy-equipment operator for the Smithtown highway department. With these backgrounds, one technical and the other adminis-

trative, the two men joined in 1940 to form the dealership.

Municipal Machinery Co., which became a member of the Associated Equipment Distributors in 1950, grew and developed by practicing and believing the old saying, "The customer is always right".

THE END

### West coast distributor handles Cleaver-Brooks line

The northern half of California and the western half of Nevada is being covered by R. F. MacDonald Co., San Francisco, the new manufacturer's representative for boiler equipment made by Cleaver-Brooks Co., Milwaukee, Wis. The firm's main office is at 1485 Bay Shore Blvd., San Francisco.

### B-E names distributors for Missouri-Kansas area

Midland Machinery Co., Chillicothe, Mo., has been appointed a distributor of the complete line of excavators, cranes, dragshovels, and dragline buckets manufactured by the Bucyrus-Erie Co., South Milwaukee, Wis. From offices on Highway 65 South, Chillicothe, and on the Belt Highway, South Route 4, St. Joseph, the firm will cover the northwestern section of Missouri and Doniphan County in Kansas.

Also offering sales and parts service on the B-E line of excavators and cranes is Contractors Supply, Kansas City, Mo. From headquarters at 1728 Walnut Street, the new distributor will handle southwestern Missouri

and eastern Kansas, with the exception of Doniphan County.

Southern Gateway Co., Cincinnati, Ohio will service the southeastern tip of Indiana, northern Kentucky, and southern Ohio. The dealer maintains complete facilities and a parts stock at 2200 Losantville Ave., Cincinnati.

### Metalweld names McKinley division service manager

The new service manager of the construction equipment division of Metalweld, Inc., Philadelphia, Pa., is Russell L. McKinley. He came to Metalweld after serving as service manager for a manufacturer of cranes and loader equipment in the midwest.

John Sardarian is the new assistant manager of the firm's parts department. He will aid J. F. McNamara, head of the department.

### Howell Tractor appoints new service manager

The new service manager of the Chicago headquarters of Howell Tractor & Equipment Co. is Lester J. Schroeder. Previously, Schroeder was assistant foreman for the engineering division of the Melrose Park Works of International Harvester Co. He has been with Howell for the past year.

### Wooldridge names dealer for New York, New Jersey

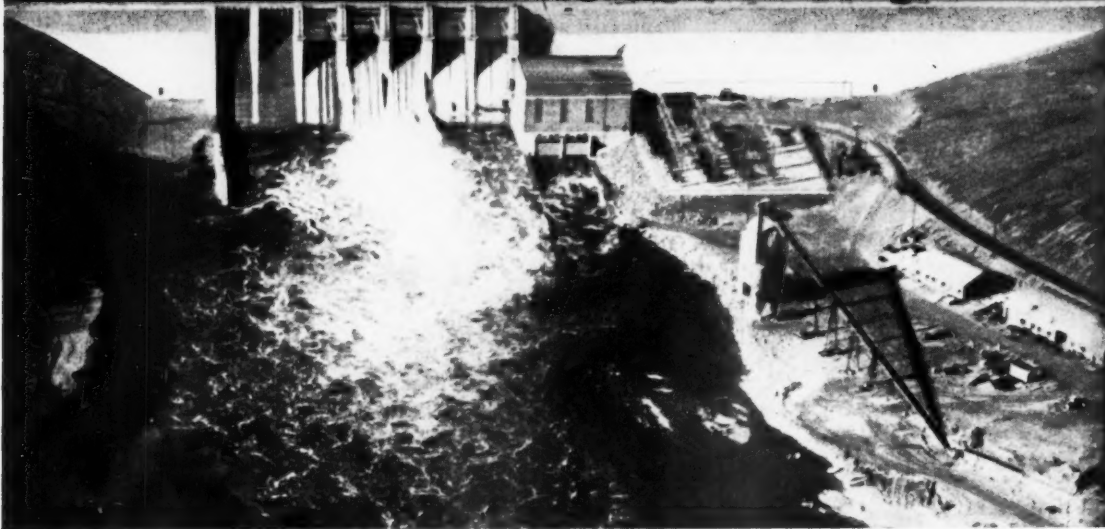
Handling the complete line of scrapers made by the Wooldridge Mfg. Division of Continental Copper & Steel Industries, Inc., Sunnyvale, Calif., is E. H. Kliebenstein Co. Located in Ridgefield, N. J., Kliebenstein will represent Wooldridge in northern New Jersey and southeastern New York.

### Hobbs names distributor

Hobbs Trailers, Fort Worth, Texas, has appointed General Body Sales Corp., Chicago, Ill., a distributor of Hobbs Schonrock cable-dump trailers in Chicago and northeastern Illinois. Located at 5838 N. Pulaski Road, Chicago, the new dealer will offer sales, maintenance, and repair work.

## Increase workability of concrete mixes and protect against frost damage

This 47,000 kilowatt hydro-electric power plant and dam was put into operation recently by a New England utility to serve customers in its rapidly growing service area. Its construction required about 227,000 cubic yards of concrete containing Aerolith.



## with AEROLITH

AIR-ENTRAINING AGENT

Aerolith is a chemically stable and rigidly controlled air-entraining agent of the Vinsol resin type. It is ready to use at the ready-mix plant or at the site of construction.

Aerolith has been tested and approved by the U. S. Bureau of Reclamation and many State Highway Commissions, and has been used since 1948 on numerous projects in the U. S. A. and abroad—where long-term durability and resistance to disruptive effects of freeze-thaw cycles are specified.

The use of Aerolith also yields these other advantages:

- Makes concrete more resistant to drastic temperature changes.
- Improves workability, mixing and placing.
- Minimizes segregation and honey-combing.
- Permits reduction of water-cement ratio.
- Reduces bleeding—speeds finishing.
- Increases resistance to water absorption and corrosive effects of salts, sea- and mineral-water.
- Compatible with other admixtures.

You'll want to know more about Aerolith. For additional information fill in the coupon below.

A Product of **Sonneborn** RESEARCH

L. SONNEBORN SONS, INC.  
Building Products Division—Dept. C5  
404 Fourth Ave., New York 16, N. Y.

Gentlemen:

We are interested in further information on AEROLITH air-entraining agent.

NAME.....

COMPANY.....

ADDRESS.....

CITY.....ZONE.....STATE.....

For more facts use coupon, or Reader-Reply Card opposite page 18 and circle No. 325

### Fireproofing data

■ An up-to-date folder on fireproofing with perlite illustrates the basic details of 38 approved fire-retardant constructions using lightweight plaster or concrete made with perlite aggregate. Diagrams show the required thickness of perlite plaster or concrete, furring details, and other basic elements to obtain the listed fire rating for columns, floors, roofs, ceilings, and partitions. Technical data for fireproofing methods that reduce dead load, occupy minimum floor space, and speed up construction are also included.

To obtain this pamphlet write to the Perlite Institute, 45 W. 45th St., New York 36, N. Y., or use the Request Card at page 18. Circle No. 8.

CONTRACTORS AND ENGINEERS





### Torque-limiting wrench for structural assembly

■ A new torque wrench said to combine rugged durability with unusual accuracy has been developed by Jo-Line Tools, Inc. Called Jotru, the new torque-limiting socket wrench was developed specifically for construction or assembly operations where nuts or bolts require correct and uniform tightening.

Constructed entirely of heat-treated alloy steel, the Jotru is designed to absorb severe punishment throughout its extensive service life. Engineered to meet critical torque-control problems, the wrench permits a maximum torque variation of only 2 per cent under actual operating conditions. The manufacturer also points out that the Jotru's built-in precision more than doubles the period normally required between calibration checks.

With the new wrench, control is completely automatic. When the proper torque has been applied, the wrench releases automatically and allows a few degrees of free rotation.

Several sizes of the new torque-limiting wrench are available. The Model 25, a 10-inch wrench, has a drive size of  $\frac{3}{8}$  inch and affords a range setting of 5 to 25 foot-pounds. The Model 500, largest in the line, is 36 inches long, has a drive size of  $\frac{3}{4}$  inch, and a range of 200 to 500 foot-pounds.

For further information write to Jo-Line Tools, Inc., 8442 Otis St., South Gate, Calif., or use the Request Card at page 18. Circle No. 130.

### Electric generating unit features idling control

■ An idling control that reduces the engine to idling speed with a flick of a lever is an outstanding feature of the new Winco 2,500-watt direct-drive engine-generator announced by the Wincharger Corp. According to the manufacturer, the development conserves fuel, extends engine life, and lowers maintenance costs.

Additional features of the Series 205B14S2D plant include light weight; close, steady voltage regulation; and an indicator pilot light. Also available as optional equipment are the Winco two-wheel Speedy-Shift dolly, and a retractable starter.

The new plant is powered by a Briggs & Stratton four-cycle engine.

For further information write to the Wincharger Corp., 6th and Nebraska Sts., Sioux City 2, Iowa, or use the Request Card at page 18. Circle No. 153.

### Offer precision level for rugged field duty

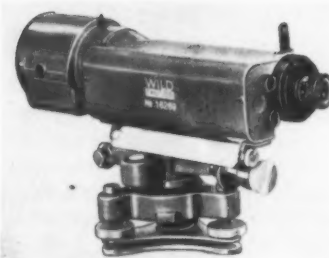
■ The Wild N-3 precision level is an instrument designed to meet the highest requirements for precision, convenience, and all-around performance under the most rugged field conditions, according to the manufacturer.

The level is said to be particularly easy to set up and operate. With the Wild Invar precision leveling staff, the N-3 has an accuracy of plus or minus 0.01 inch in one mile of single leveling. The telescope, internally

focused and with coated lens, is said to have good luminosity and a magnifying power of 42X. Centering is accomplished by means of the standard Wild prism system in which the bubble ends are brought to coincidence.

Models of the Wild N-3 available include the Standard Metric, Special Industrial, and Special Engineer—all with tilting screw, coincidence level, and built-in optical micrometer.

For further information write to Wild Heerbrugg Instruments, Inc., Main at Covert Sts., Port Washington,



The Wild N-3 precision level.

N. Y., or use the Request Card at page 18. Circle No. 152.



Five to 6 passes by the  $1\frac{3}{4}$ -yd. shovel fill Rear-Dump to heaped capacity. In making change-over from scraper to rear-dump, same tires, wheels, brakes, and controls are used.

## Alabama contractor shows how to get "double value" from each dollar of equipment investment

"Interchangeability" has a powerful meaning to Clyde O. Mitchell, Birmingham. It's the way he assures himself "double value" from his versatile C Tournapulls.

For dirtmoving, Mitchell hitches 14-yd. scrapers behind his 2-wheel "C" prime-movers. Whenever he encounters shovel rock, he switches scraper bodies for rear-dumps to handle this problem. The ability to switch to rear-dumps eliminates added ownership or rental expense of trucks, reduces maintenance cost as well as equipment and parts inventory, and permits operation under weather and haul road conditions that would shut down truck operation.

### Double duty means added profits

Mitchell has made extra profits twice so far on important jobs because of this quick-change feature of his C Tournapulls.

First double-duty assignment was a state highway improvement job at Decatur, Alabama. On this job, the scrapers handled 800,000 yds. of dirt, while Rear-Dumps moved 100,000 yds. of rock.

Recently he relocated and straightened 4.1 miles of State Highway 431 between Attalla and Boaz. Here, of the 486,000 cu. yds. of material to be moved, about 16% was rock, 75% chert, and 9% clay. The dirt-

moving was handled by two C Tournapulls with Scraper, three 18-yd. tractor-drawn FP scrapers, and three self-propelled scrapers of another make. The Tournapulls were then equipped with Rear-Dumps to haul rock... about 78,000 yards.

### 4200' cycle every 6 minutes

Time studies show the Tournapull Rear-Dumps are real producers. With wide, easily entered bodies, they were loaded with 10 pay yards by a  $1\frac{3}{4}$ -yd. Lorain shovel in an average of 1 minute, 40 seconds. Working 4200' cycles, each round-trip took only 6 minutes. Haul and return speeds averaged 12 mph. Hourly output for the 2 machines was 180 pay yards per 55-minute hour.

### More speed on long hauls

This kind of production and Tournapull interchangeability highly pleases the owners. Says Supt. G. M. Wakefield: "I like the C Tournapull prime-mover. It's got a good scraper and rear-dump. It will stand up against any dirtmover."

Adds operator C. L. Moore: "The Tournapull can turn everywhere, and it's got more speed on long hauls. It's simple to understand... easier to operate than other rigs."

Figure out for yourself on the basis of cost alone the extra value of Tour-

napull interchangeability. An additional haul unit costs about 25% of the total initial price of prime-mover and original haul-unit combination. Interchangeable haul-units can be purchased at any time.

Find out how this double-duty equipment can give you double earning power for every dollar of investment. For more facts and owner-verified case histories, write or phone today.



Dumping on the run, Rear-Dump builds sub-grade in cut where rock has been removed. Average dumping time was about 20 seconds. Electric controls respond instantly for steering and controlled dumping.

Tournapull—Trademark Reg. U.S. Pat. Off. R-801-H-b



**LeTourneau-WESTINGHOUSE Company**  
Peoria, Illinois

A Subsidiary of Westinghouse Air Brake Company

For more facts, use Reader-Reply Card opposite page 18 and circle No. 326

## Air-entraining agent for ready-mix concrete

■ An air-entraining additive designed for use in ready-mix concrete and concrete products is manufactured by the Nopco Chemical Co. The agent, called Ertrane C, is furnished in powder form for solution in cold or hot water.

Though the solution may easily be prepared at the job site, the agent is especially designed for use by ready-mix concrete producers. A 60-pound bag of Ertrane C is dissolved in 41 gallons of water to make a 15 per cent solids solution of air-entraining agent.

The easily prepared agent is recommended because it reduces bleeding and increases plasticity of the freshly placed concrete. Segregation of the

aggregate while the ready-mix concrete is in transit is also said to be materially reduced.

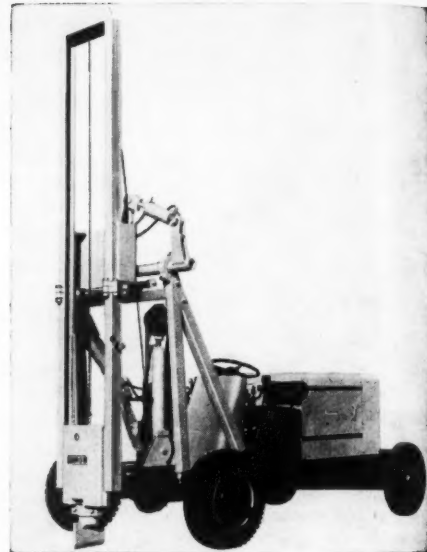
Because Ertrane is shipped in powder form, it is said to be both more economical and less bulky to handle than liquid agents.

For further information write to the Nopco Chemical Co., Lewis & Carter Sts., Harrison, N. J., or use the Request Card at page 18. Circle No. 148.

## Goodyear executive change

The Goodyear Tire & Rubber Co., Akron, Ohio, has promoted F. J. Carter to the post of vice president in charge of industrial relations, succeeding Fred W. Climer, who has retired. Carter had been personnel director.

The Arrow mobile hydraulic hammer.



## Mobile hammer employs 8,000 foot-pound force

■ A self-propelled, one-man-operated hydraulic hammer which uses a variety of breaking, cutting and tamping heads is marketed by the Arrow Mfg. Co. The machine is capable of a blow of up to 8,000 foot pounds pressure.

An angling tower, work speeds of from 1 to 20 feet per minute, and ease of operator control are features of this machine, which employs a 1,000-pound hammer and a stroke of 8 feet. The tower folds for travel, reducing the height of the machine to 8 feet 3 inches.

The Arrow hydraulic hammer is 12 feet 3 inches long, 14 feet 3 inches high (in working position), and weighs 6,700 pounds. A Chrysler Model IND-30 64-hp engine provides working and traveling power.

Available tools include 30 and 72-inch tampers; a heavy-duty breaker; concrete punches, wedges, and heavy-duty chisels, an asphalt-cutting head, and a post-hole or pile driver.

For further information write to the Arrow Mfg. Co., Box 4120, S. Denver Station, Denver 9, Colo., or use the Request Card at page 18. Circle No. 138.

## Saudi Arabia plans aerial mapping program

Nearly 65,000 square miles have been photo-mapped to date in the aerial mapping survey sponsored by the government of Saudi Arabia to speed the country's broad natural-resources development program. The survey covers the Shield area of the country, believed to be potentially rich in minerals.

Aero Service Corp., Philadelphia, Pa., is conducting the work.

## Cummins mobile unit to make nationwide tour

A mobile demonstration unit, bringing the latest service information to Cummins diesel service men throughout the country has been put into operation by the Cummins Engine Co., Columbus, Ind. The company hopes to contact 10,000 service personnel within the next year by means of the unit.



## "Never lets me down"

says Everett Datton, San Antonio, Texas,  
about the Allis-Chalmers Model D Motor Grader.

It's two homes a day, out Texas way—as Quincy Lee Construction Company works on a big-scale project of building 1400 new homes in two years.

One of the machines on the job is an Allis-Chalmers Model D motor grader used to grade roads, landscape homes and build driveways. Owner Quincy Lee says this about his Model D: "I'm very happy with it. It does a very fine job for us." Operator Everett Datton says,

"I like the Model D. It gets in and out of tight spots, especially where buildings are close together. With the D's fine

control I can work between newly-planted trees and close to sidewalks without damaging trees or chipping cement. Not only is this machine good at fine grading, but its diesel engine has plenty of power for handling full capacity loads. I run it 9 hours a day, 5½ days a week. *She never lets me down.*"

Quincy Lee and Everett Datton are confirming what thousands of other Model D operators and owners know. In its class, you just can't beat the D for sure-fire performance at low cost. Watch it in

action and you'll be amazed how the D's right combination of weight, power and traction lets it handle a wide range of jobs. And you can choose either diesel or gasoline engine models, plus number of attachments—including rear-mounted ¾-yd loader and midship-mounted hydraulic scarifier, to increase the Model D's usefulness and efficiency.

See the Model D now at your Allis-Chalmers construction machinery dealer—headquarters for factory-trained servicemen, factory-approved facilities and True Original Parts.

**Model D**  
50 belt hp  
diesel or gasoline  
engine

ALLIS-CHALMERS, CONSTRUCTION MACHINERY DIVISION, MILWAUKEE 1, WISCONSIN

**ALLIS-CHALMERS**



For more facts, use Reader-Reply Card opposite page 18 and circle No. 327





The Allmand Electric Lantern may be wheel-mounted for mobile use as a floodlight assembly.

#### Contractor's light unit for nighttime operation

■ A contractor's floodlight assembly which provides 2,500 or 3,500 watts of light for night construction or maintenance work is manufactured by Allmand Bros. Mfg. Co., Holdrege, Nebr. The assembly is skid or wheel-mounted for use in the back of a pickup truck or as a mobile unit.

Five or seven 500-watt weather-proof floodlights adjustable in all directions are clustered atop a telescoping steel tubing standard in the Allmand Electric Lantern. The Allmand permanent-magnet ac generator, a brushless, bearingless, single-phase, 120-volt unit developed by the company, teams with either a Hercules liquid-cooled or Wisconsin air-cooled engine to provide current. A 110-volt outlet is provided for operation of power tools.

Two sizes of standard are available: one adjustable from 9 to 15 feet, and another adjustable from 13 to 22 feet. The guard frame and skids are constructed of 3-inch structural steel. The light assembly is easily detached for storage or transporting.

For further information write to the Allmand Bros. Mfg. Co., Holdrege, Nebr., or use the Request Card at page 18. Circle No. 141.

#### Construction tools

■ A catalog showing the full line of Mall construction tools is available from the manufacturer. The catalog also contains a listing of specialized catalogs that are available. Illustrations, descriptions, and specifications on all Mall products, including concrete vibrators and vibrator heads, power trowels, electric generators, pumps, chain saws, augers, drills, and portable electric and pneumatic tools, are presented.

To obtain Catalog 41 write to the Mall Tool Co., 7740 S. Chicago Ave., Chicago 19, Ill., or use the Request Card that is bound in at page 18. Circle No. 12.

#### Topping for concrete

■ A folder describing Latex concrete topping is available from the manufacturer, The Camp Co., Inc., of Chicago. The topping is reported to be self-bonding, self-curing and resistant to water, grease, oil and lactic acids. The folder states that a surface is ready for use in 45 minutes at normal temperatures and claims no priming is necessary. Latex can be applied over any clean, stable surface, damp or dry. It may be used for shallow as well as for deep repairs,

and is the color of concrete.

To obtain this folder write to The Camp Co., Inc., 6958 S. State St., Chicago 21, Ill., or use the Request Card at page 18. Circle No. 14.

#### N. J. Assembly approves work on Narrows Span

In a vote of 53 to 2, the New Jersey State Assembly authorized the Port of New York Authority to construct the \$220,000,000 Narrows Bridge linking Brooklyn and Staten Island.

The measure now goes to Governor Robert B. Meyner who has indicated willingness to endorse it.

Approval must also be given by the U. S. Army and the New York City Board of Estimate.

The New Jersey Assembly also adopted and sent to the Senate a bill authorizing the Port Authority to contribute \$9,000,000 toward the construction of two minor spurs to the Newark Bay-Hudson County extension of the New Jersey Turnpike. One would link the pike directly to Newark Airport, the other to Hoboken.

## Ride the new "660"

150 hp...8 forward speeds...does more work in less time!

The best way to judge a horse...or a car...or a grader, is to ride it. Get behind the wheel of a modern Adams "660" and see for yourself!

You'll find the big diesel engine starts readily in any kind of weather. Convenient and positive-acting power-controls raise, lower, revolve, or extend the 12-ft. blade to any desired position.

Pull the throttle and feel the surge of power. Set the blade for a deep cut, then watch the dirt boil over-and-out as the big tires take hold, and see how the machine hangs on to occasional over-loads. Note how Adams constant-mesh transmission provides easy gear shifting with no clash of spur gears.

#### Flexible speed range means more work per day

Eight forward speeds (1.4 to 25 mph) provide the necessary wide speed range to handle all operations at the fastest practical rate. Three addition-



al "creeper speeds" (.23 to 1.82 mph) are optional. These "slow motion" speeds gear the grader to extra-low speeds—no need to slip the clutch. Make it easy to rip up rocky and rooty terrain with less shock to the grader. Creeper speeds are important, also, for accurate finishing in tight places. No other grader offers this wide range of eleven forward operating speeds. They mean more and better work done, in less time, also mean a big saving in downtime and maintenance.

#### 4 Reverse speeds (1.8 to 13 mph)

This wide range of backing speeds saves time on every cycle. You can back at 13 mph for a second cut. Or you have a good range of working speeds for grading or mixing on the reverse part of the cycle. This reverse range provides extra safety, extra accuracy for maneuvering.

Applying double-action hydraulic brakes to wheels also brakes transmission...gives greater safety in quick, sure stops, with less pedal action, less strain on machine.

Leaning front wheels balance the pull of the blade, give more accurate control on slopes, reduce stress, make steering easier, safer.

Engine rubber-mounted. No engine vibration is transmitted to grader to annoy and fatigue the operator. Means better operator satisfaction and efficiency.

#### See the "660" ADAMS before you buy any grader

Judge your next motor grader on the basis of performance. Ask your LeTourneau-Westinghouse Distributor to show you a "660" in action. Ride one of these machines. Find out for yourself why Adams motor graders do more work, in less time, at lowest cost.

#### A size ADAMS for every need

**Model 660**—150 hp diesel, 27,730 lbs. A big grader for big jobs—high production on construction work.

**Model 550**—123 hp diesel, 23,500 lbs. Heavy-duty, all-purpose machine, out-works anything in its class.

**Model 440**—104 hp diesel, 21,500 lbs. A good producer on all average grading and maintenance work.

**Model 330**—80 hp diesel, 20,500 lbs. A good general-purpose machine with surprising capacity.

**TravelLoader**—high-speed, heavy-duty, self-propelled, belt-type loader. Loads trucks from windrows or stockpiles.

AG-3-G-1



Equipped with dozer-blade, Adams grader backfills, dozes trees and stumps, push-loads scrapers, moves debris off right-of-way, fills in around culverts, and does "handy-man" jobs usually assigned to special tools. With V-type snow-plow "660" can buck heavy drifts.



Operator on any Adams grader can move blade from ditch to bank-cutting position in less than a minute. Horizontally he can reach up to 7½' outside the wheels. Blade is fully reversible...note high 28" clearance under front-axle for straddling high windrows.



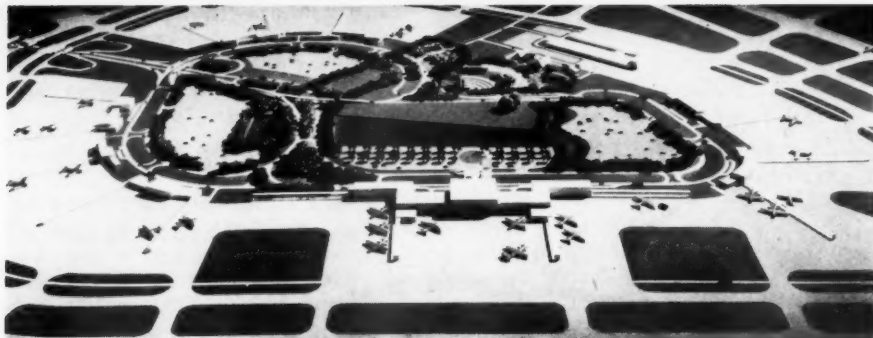
**LeTourneau-WESTINGHOUSE Company**

Peoria, Illinois

A Subsidiary of Westinghouse Air Brake Company

For more facts, use Reader-Reply Card opposite page 18 and circle No. 328

## Drive 6,500 timber piles in airport modernization job



A model of the passenger terminal at the New York International Airport, with the Arrival Building and the Wing Buildings in front. Arcade extensions, serving foreign and domestic lines, project from the oval terminal area.

The driving of 6,500 timber bearing piles marked the beginning of construction of the \$17,500,000 International Arrival Building at New York International Airport, Jamaica, N. Y. Featured in the \$60,000,000 Terminal

City modernization development at the airport are this building, two adjacent Airline Wing Buildings, and arcade extensions which will span an area of over 11 city blocks—about 2,200 feet in length. Work is scheduled for completion in June 1957.

## It costs less to PUSH PIPE than dig ditches



cut job costs and installation time...

### USE RODGERS HYDRAULIC JACKING UNITS

You'll cut pipe laying expenses and do the job faster and better by pushing pipe under highways, railroad tracks, and other obstructions. You'll avoid time-consuming ditching, backfilling, tamping and paving operations that delay the job and roll up the cost.

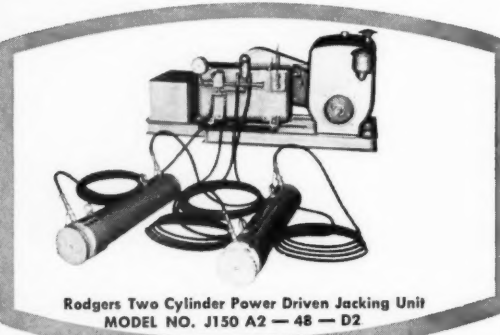
Rodgers Hydraulic Jacking Units can be used wherever you want to PUSH, LIFT or PULL. Multiple jack installations provide equal pressing or lifting power at all points and are ideal for raising or positioning large structural sections.

Photo shows a public utilities crew pushing a 16" diameter steel pipe in 16-foot sections through 44 feet of earth. Two 150-ton capacity, 30-inch ram travel, double-acting Rodgers Jacking Cylinders are doing the job. A hand operated Rodgers Hydraulic Pump furnishes equal power to both jacks.

Rodgers Jacking Cylinders used singly or in groups provide steady, precisely controlled power to jack steel casing, corrugated pipe or compressed concrete tile—and they can be used for all types of accurately controlled lifting operations on structures.

Rodgers Jacking Cylinders are available in capacities from 50 to 600 tons with standard ram travels from 6 inches to 48 inches. Longer ram travels to 72 inches available on special order. Tunnel contractors are invited to inquire about our special hydraulic equipment for tunnel shield construction which includes a series of special hydraulic cylinders, power pumps and controls.

A selection of hand or power operated Rodgers hydraulic pumping units offer the exact jacking combination needed for your job. Let Rodgers engineering department assist you in your selections.



Rodgers Two Cylinder Power Driven Jacking Unit  
MODEL NO. J150 A2-48-D2



Send for your free copy of Rodgers Bulletin, 317A. It contains a complete description of Rodgers Hydraulic jacking units, quick couplers, valves and hoses, also a description of hydraulic equipment used in the construction of tunnel shields.



**Rodgers Hydraulic Inc.** 7415 WALKER ST., MINNEAPOLIS 16, MINN.

For more facts use Reader-Reply Card opposite page 18 and circle No. 338

### Foundations require piles

Foundation work, awarded to Wortmann & Sons, Inc., New York, N. Y., under a \$700,000 contract by The Port of New York Authority, began last October and was completed this past February. Creosoted timber piles 20 to 30 feet long with 12-inch butts and 8-inch tips were driven in rows of clusters by Vulcan 50-C steam hammers mounted on the rear of two Marion 32 cranes. The pile-driving was subcontracted to Kelly Pile Driving Co., Jamaica, N. Y. Koppers Co., Inc., New York, N. Y., delivered the piles to the site in trucks. The piles, driven to a 25-ton bearing, had a minimum required penetration of 18 feet in order to pass through strata of sand and organic silt covering the hydraulic fill of the airport. Driving was generally stopped at 24 blows per foot of penetration once the 18-foot penetration was obtained. The 655-acre Terminal City area and the remainder of the 5,070-acre International Airport are founded on hydraulic fill which was pumped out of Jamaica Bay in 1942.

Each pile-driving rig, averaging 50 piles per 8-hour day, drove separate rows of piles. There are six rows in each of the two 240-foot-long apron wings, six in the adjacent wing buildings, and 15 in the center section of the Arrival Building. The pile clusters, driven in an excavated trench for each row, were cut off at design elevation by a chain saw powered by a Homelite gasoline-driven generator.

Carver gasoline-driven pumps kept the 5-foot-deep trenches free of rain and ground water. Earthmoving around the site, amounting to over 40,000 cubic yards, was handled by three Caterpillar 16-yard scrapers pulled by International tractors and two International tractor-dozers for push-loading and rough grading. A small crane with a clamshell bucket excavated for trenches.

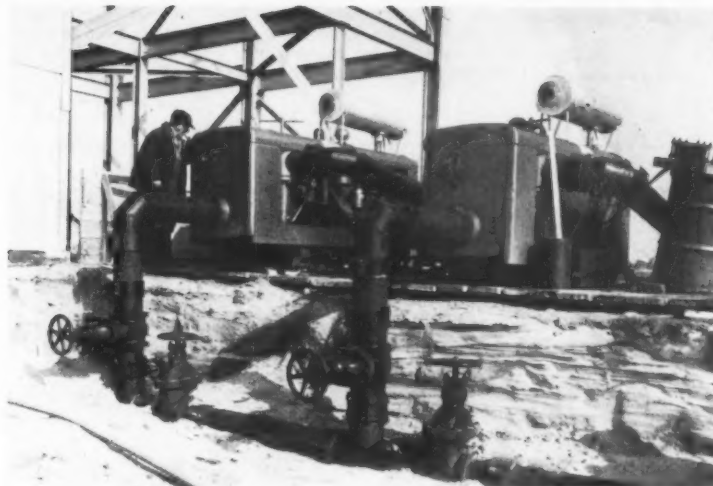
### Tunnel for utilities

Ground water was encountered during the excavation for a concrete tunnel which will run under the Arrival Building and house all of the utility ducts to the building. Located just behind the existing Port Authority-built Control Tower, which will be modernized and incorporated into the new development, the tunnel required

CONTRACTORS AND ENGINEERS



**Two steam hammers average 50 driven piles per 8-hour day; wing buildings, arcades, roads, bridges, complete project**



Two 8-inch pumps of the Complete wellpoint system dewater the excavation for the concrete duct tunnel which will house all of the utilities for the Arrival Building.

an excavation 152 feet long, 8 feet wide, and 8 feet deep. To offset the water condition, Wortmann installed a Complete wellpoint system with points sunk approximately 15 feet along the edges of the proposed excavation. GM diesels powered the system's two 8-inch pumps.

Water, discharged through an 8-inch line, emptied into one of the existing airfield's manholes, eliminating the need for ditches or sumps. With the wellpoint system installed and the tunnel excavated by crane, Wortmann built the reinforced-concrete tunnel with forms fabricated on the job. About 75 feet long with 12-inch-thick walls, roof, and floor slabs, the tunnel has overall dimensions of 8 x 8 feet.

To complete concrete work on the building foundations, concrete caps, varying in size according to their relative position in the building, were poured on each pile cluster. Some of the smaller caps measure 2 x 5 feet and are found under the two-story wing and apron extensions, while some of the larger caps, measuring 10 x 14 feet and 3 1/2-feet thick, are located under the center three-story section of the International Arrival Building. The caps were cast in place with ready-mix concrete delivered to the job by Colonial Sand & Stone Corp., New York, N. Y.

**Unique features of buildings**

The International Arrival Building is designed to handle all incoming international passengers requiring customs, health, and immigration clearance. Incoming passengers will use the first floor of the two arcades in moving to the inspection area, while outgoing passengers will be at the second-floor level until they descend at their particular gate positions. The arcades will connect with the federal inspection services located on the first floor.

The building will also contain restaurant facilities, consumer and airline services, and a partially enclosed 4,300-foot observation deck. An elevated promenade will connect the building with the 11-story Control Tower and with the public parking areas. Adjacent to and connecting with either end of the Arrival Building will be two Airline Wing Buildings which will house the ticket counters, lobbies, and offices of the foreign-flag airlines serving the airport.

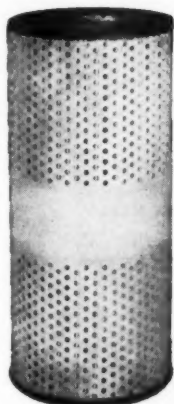
Outgoing international passengers will arrive at their particular airline offices in Wing Buildings and proceed to the second-floor level on their way to aircraft loading gates. A total of 24

(Concluded on next page)



103 drawbar horsepower is feature of new International TD-18A Diesel crawler.

**What if dirty oil gets into the engine of a heavy-duty diesel like this?**



A bearing can be worn seriously in a matter of hours if dirt-laden oil by-passes the filter and gets into a Diesel engine. This danger from by-passed, unfiltered oil is behind your International Harvester dealer-distributor's insistence that you use manufacturer-approved filter refills. He knows that they never get overloaded . . . never by-pass dangerous, dirty oil . . . never let harmful abrasives reach your engine. The reason is simple: they're built by Purolator to meet International Harvester's exacting requirements for every particular engine.

For the same reason, it pays to insist on manufacturer-approved filter refills for your Diesel. Its engine life depends on it.



PUROLATOR PRODUCTS, INC., Rahway, New Jersey, and Toronto, Ontario, Canada  
For more facts, use Reader-Reply Card opposite page 18 and circle No. 339

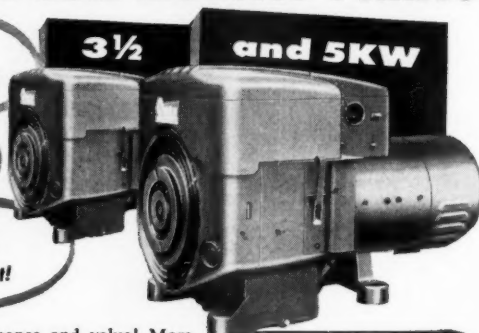
A Marion 32 crane with Vulcan 50-C hammer drives 20 to 30-foot-long timber piles for the foundation of the International Arrival Building. The piles, driven to 25-ton bearing at a minimum penetration of 18 feet, were cut off with a chain saw. ▶

## New ONAN CCK Electric Plants

**MORE  
OUTPUT**  
per pound of weight!

**MORE  
OUTPUT**  
per gallon of fuel!

**MORE  
OUTPUT**  
per dollar cost!



Way ahead in performance and value! More powerful, two-cylinder, air cooled Onan gasoline engines of 4-cycle, horizontally-opposed design give smooth, quieter, effortless performance. Short stroke and moderate speed cut engine wear, give longer life. Quality features include rotating Stellite-faced exhaust valves, solid Stellite valve seat inserts, full pressure lubrication. Onan's exclusive Vacu-Flo cooling system available for difficult or "buried" installations.

Completely Onan-built, with Onan gasoline engines direct-connected to Onan all-weather generators in compact, rugged units. Available in stationary, portable and standby models with a wide range of accessories.

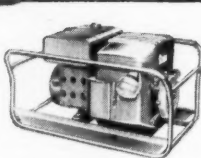
Write for folder on all CCK models



**D. W. ONAN & SONS INC.**

2860 University Avenue Southeast, Minneapolis 14, Minnesota

For more facts, use Reader-Reply Card opposite page 18 and circle No. 340



### PORTABLE MODELS

Available with carrying frames or 2-wheel dollies. Easily portable. Other Onan portable models: 500 to 10,000 watts.



(Continued from preceding page)

aircraft positions will be provided for the three buildings.

U. S.-flag airlines, housed in individual terminal buildings located around the oval-shaped 655-acre Terminal City area, will provide 116 aircraft gate positions. Terminal City will provide a total of 140 aircraft gate positions in the most modern air terminal in the world.

### Other work in progress

A recently-let contract covers the construction of six miles of dual-lane highways, two miles of service roads, and six bridges to connect the road network with the individual airline terminals in the development. This \$3,746,000 contract, awarded to Tully & Di Napoli, Inc., Flushing, N. Y., is

slated for June, 1957, completion.

Another contract, amounting to \$2,649,000, covers the construction of five miles of taxiway to complete the dual peripheral taxiway system linking the runways and taxiways to the present ramp areas. This work, also scheduled for completion next June, is being done by Tufano Contracting Corp., Flushing, to allow one-way traffic control on each of the two oval taxi strips. This will expedite the movements of aircraft between the central terminal area and the farthest points of the airport.

### Personnel

George Dumbleton was the superintendent for Wortmann & Sons, and M. O'Rourke, the superintendent for Kelly Pile Driving Co.

THE END

**W**hen  
Abrasoweld and  
Faceweld handle  
9 out of 10  
hardsurfacing  
jobs...

**H**ave a full  
line of buildup  
and hard-  
surfacing rods  
behind them...

**Y**et cost less  
to buy...

**WHY**  
use anything  
but LINCOLN  
hardsurfacing  
rods



**Gets up to 3 times more  
wear per dollar with...**

**ABRASOWELD**, high alloy carbon-chromium rod for severe impact and abrasion and

**FACEWELD**, high alloy chromium carbide for severe abrasion, moderate impact.

### TRY THESE TWO RODS

Send for Application  
Weldirectory SB-1352  
by writing



**THE LINCOLN ELECTRIC COMPANY**  
Cleveland 17, Ohio

THE LINCOLN ELECTRIC COMPANY  
Dept. 5308  
Cleveland 17, Ohio

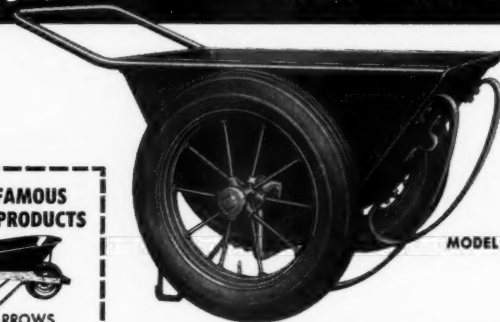
☐ Send me Bulletin SB-1352  
☐ Have representative call

Company \_\_\_\_\_  
Address \_\_\_\_\_  
City \_\_\_\_\_ State \_\_\_\_\_  
Name \_\_\_\_\_  
Position \_\_\_\_\_

For more facts, use coupon, or Reader-Reply Card opposite page 18 and circle No. 341

**CONCRETE  
CARTS**

Oldest and Largest  
by **JACKSON** Wheelbarrow  
TRADE MARK Maker In America



MODEL 8-88

### OTHER FAMOUS JACKSON PRODUCTS



WHEELBARROWS



WHEELS



GAS  
SALAMANDERS



MIXING BOXES



MORTAR  
PANS

Rugged Jackson concrete carts have perfect balance and **rocker runners** for controlled dumping. Won't roll back on operator. Equipped with drop axles. Steel or pneumatic tired wheels with roller bearings and zerkl fittings. Available in many models with 6, 8, or 10 1/2 cu. ft. heaped capacity.

ASK YOUR CONTRACTOR EQUIPMENT DISTRIBUTOR

**Jackson**

Manufacturing Co. • Harrisburg, Pa.

For more facts, use Reader-Reply Card opposite page 18 and circle No. 342

CONTRACTORS AND ENGINEERS





The Kelley Hydra-Trowel.

## New hydraulic trowel makes finishing easier

■ A new hydraulic trowel for the floating, leveling, and troweling of concrete surfaces has been placed on the market by the Kelley Machine Division of the Wiesner-Rapp Co. Known as the Kelley Hydra-Trowel, the machine is available in three 34-inch-diameter and three 44-inch-diameter models.

The finishing work is done by four blades driven by either gasoline engine or electric motor through a gear reducer. The blades, which are at 90 degrees to each other, are mounted independently of the stationary guard ring. Thus, the blades cannot be misaligned when the machine is picked up and carried by the guard ring.

The pitch of the four blades is changed by means of a hydraulic system which is controlled by a fingertip lever on the handle, close to the grips. Because of the cushion effect of the hydraulic system, the machine reportedly will not tip or jolt if the blades should pass over a loose piece of aggregate. When the trowel idles or stops, the blades go down automatically, preventing dig-in.

The blades, which are heavy-gage spring steel, are high-pitch and can be used for both floating and finishing. This feature eliminates the need

for changing blades when these two operations are done. An extra-long handle, with grips spaced widely apart, gives greater leverage in control of the machine and thus increases the ease of operation.

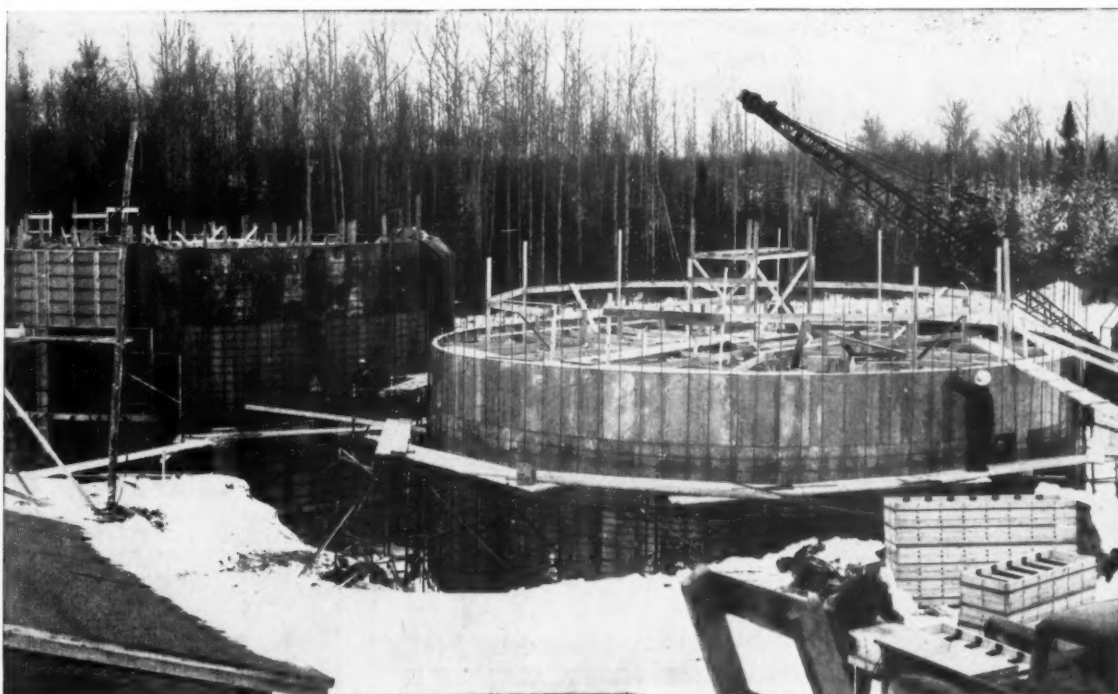
According to the manufacturer, the machine is well-balanced, thus eliminating pulling or drifting. Continuously smooth and regular rotation of the blades is said to cut troweling time and to increase the efficiency of workmen because they do not have to fight the machine.

For further information write to the Kelley Machine Division of the Wiesner-Rapp Co., 285 Hinman Ave., Buffalo 23, N. Y., or use the Request Card at page 18. Circle No. 144.

*Remember—safety is no accident!*



"Would you be interested in a package deal?"



Snow failed to halt pouring operations on the large Hoyt Lakes, Minn. water treatment plant of the Partridge Lakes Development.

## 8,500 Feet of Symons Forms Assembled on Job Site

A total of 12,000 square feet of Symons forms with steel cross members were used on water treatment plant. The job consisted of two digesters having an inside diameter of 45 feet, with walls 21 feet high and a wall thickness of 15 inches; one operating building with walls varying in height from eight to 18 feet; four clarifiers—two 17 feet high, two 11 feet high—with an inside diameter of 50 feet and wall thickness varying from 12 to 35 inches.

There are also two filter tanks with adjoining control structure. Each tank has an inside diameter of 66 feet. Wall heights vary from 14 feet to 23 feet and wall thickness varies from 10 to 16 inches. Special panels designed for the project by Symons engineers, involved forming a 45° haunch which continued around the perimeter of the four clarifier tanks. Corbel brackets were placed 30° on center of the interior secondary digester tanks which were poured monolithic with the wall.

All details of a forming job from start to finish are included in Symons Service. Our engineering staff will furnish complete form layouts and job cost sheets on form work at no charge. Our experienced salesmen give advice on efficient form erection, pouring and stripping methods.

Symons Forms, Shores and Column Clamps may be rented with purchase option, all rentals to apply on purchase price.



Carpenter nails cross braces in place for Symons Forms.



Workman nails plywood section into place, part of the 8,500 feet of Symons knocked-down forms.



Assembled forms are stacked ready for use. Workmen apply oil to one of the completed forms.

### Symons

CLAMP & MFG. CO.

4251 Diversey Avenue, Dept. E6, Chicago 39, Illinois

Please send complete information on the items checked.

☐ Forms
☐ Form Ties
☐ Column Clamps
☐ Shores
☐ Scaffolding
☐ Catalog F-11

Name \_\_\_\_\_

Firm \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ Zone \_\_\_\_\_ State \_\_\_\_\_

For more facts, use coupon, or Reader-Reply Card opposite page 18 and circle No. 344

## Sengen

### Derricks Hoists Winches

Over 50 years serving contractors . . . easily rigged on the job . . . conservatively rated for safety . . . simple in design . . . low-cost maintenance.

See your dealer . . . or write for latest catalog.

### Sengen

**DERRICK COMPANY**

3127 W. GRAND AVE., CHICAGO 22, ILLINOIS

For more facts, circle No. 343

## Sealed-beam floodlights resist shocks, weather

■ Spring - mounted, sealed - beam floodlights ranging in size from 150 to 500 watts with medium and mogul base sockets are offered by the A&A Mfg. Co., Inc. The manufacturer reports the units are shock resistant and weatherproof and recommends their use in illuminating night construction work.

The frames are equipped with a center-pedestal swiveling cradle to permit focusing of the wide-spread beam in all directions. Four bolts anchor the steel base, which can be mounted horizontally or vertically on all types of outdoor equipment.

Tension on the patented spring-base socket is held uniform under

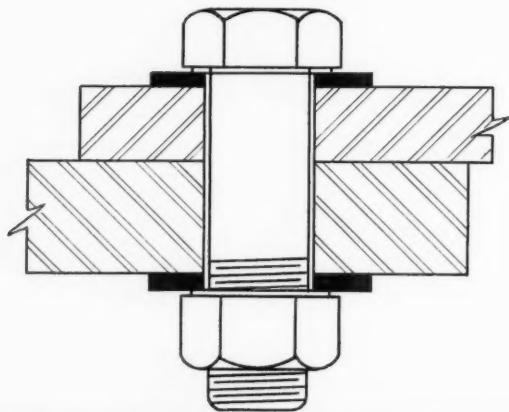
all temperature extremes. The sealed-beam lamps are protected by 1/4-inch-thick, noncorrosive, cone-shaped aluminum reflectors.

For further information write to the A&A Mfg. Co., Inc., 2017 W. Clybourn St., Milwaukee 3, Wis., or use the Request Card at page 18. Circle No. 26.

## Goodyear subsidiary moves to new location

Rubarite, Inc., producer of a rubber additive for use in asphalt and tar for roadbuilding, airstrip, and other operations, has moved to new quarters at 1702 Philtower Bldg., Tulsa, Okla. Company offices were formerly located in the Board of Trade Building, Chicago, Ill.

# Specify — MIL-CARB<sup>®</sup> CARBURIZED WASHERS



## for GREATER CLAMPING FORCE in High Strength Steel Bolting

Structural engineers and contractors know today that high strength steel bolts, with properly hardened MIL-CARB<sup>®</sup> steel washers, provide a form of steel jointing superior to riveting in many ways . . . including faster, more economical construction.

Don't overlook the fact that no bolt is any better than its washers! Don't let washers be the weak link in your steel framing construction chain. MIL-CARB carburizing permits securing and holding desired tension — eliminates "galling" or grinding of washer by the nut, assuring permanent, uniformly strong, tight joints.

MIL-CARB Washers are fabricated from Prime Carburizing Quality Special Soundness Steel to insure uniform quality control, always equal to or exceeding the rigid specifications for high strength bolted steel construction.

For your own protection and for uniformly sound construction, specify MIL-CARB<sup>®</sup> Carburized Washers and accept no substitutes.

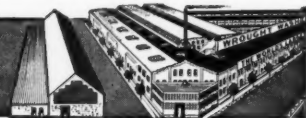
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The new Ateco scarifier

## New hydraulic scarifier with retractable shanks

■ Designed especially for Caterpillar Traxcavator Models 977, 955, and 933, a new retractable hydraulic scarifier is now in production by American Tractor Equipment Corp. of Oakland, Calif.

The scarifier is a rigid single-unit assembly consisting of drawbar and cylinder supports which bolts on the rear of the Traxcavator, providing extra strength and simplified installations. The unit does not interfere with lubrication or servicing of tractor clutch, battery, or other parts, according to the manufacturer. Two cylinders raise and lower the heavy-duty

frame, which accommodates up to five curved scarifier shanks. The head frame will accommodate many other attachments.

The shank digging angle provides fast penetration down to a maximum 14-inch ripping depth, and the curved shank design rolls the material up and back of the head frame for efficient scarifying with no clogging.

For further information write to the American Tractor Equipment Corp., 9131 San Leandro Blvd., Oakland 3, Calif., or use the Request Card that is bound in at page 18. Circle No. 133.

## MIX and PAVE — ... ALL IN ONE OPERATION



**THE  
BURCH  
MODEL 12  
PAVER and  
RESURFACER**  
**ONE MAN  
CONTROL**

Mixes, spreads, and levels bituminous material 10 to 12 feet wide in ONE pass. Material is rolled and mixed FOUR times. Easily adjusted to spread uniform thicknesses over varying contours. Wheel base is 22' 10". The Burch Paver is tractor-pulled — but its operation is hydraulically controlled, with power supplied by a self-contained gasoline engine.

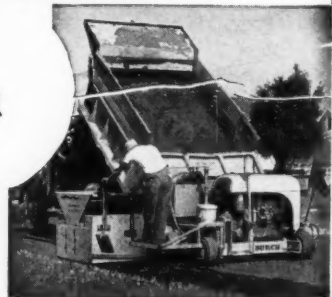
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(PATENTS PENDING)

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- 4-speed conveyor belt.
- Will empty its hopper as fast as you can fill it.
- Equipped with BURCH exclusive truck coupler and special BURCH adjustable truck hitch.
- Applicable to any standard dump truck.
- No blocking of highways—right hand lane always open for traffic.

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The BURCH Road Widener is attachable to any truck. Built-in conveyor, which is driven by heavy industrial gas motor, will deliver material where required. It will handle sand, gravel, stone, or bituminous material. Self-propelled and steered by hydraulic equipment. A high speed unit unexcelled in road construction.

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CONTRACTORS AND ENGINEERS



## Portable belt conveyor reaches 27-foot height

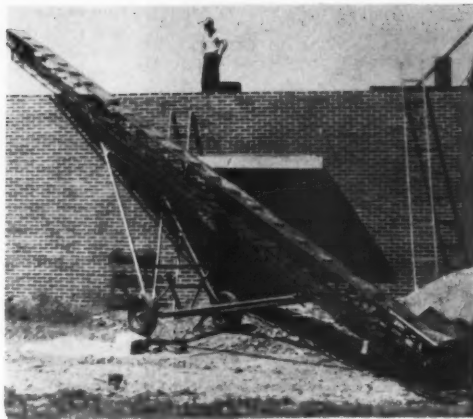
A new portable belt conveyor for handling sand, gravel, concrete, cinders, and other materials has been announced by The Fairfield Engineering Co. of Marion, Ohio. The unit, though recommended especially for use by building contractors, is said to have wide material-handling application.

The Model 618 conveyor is 40 feet long, weighs one ton, and has a maximum discharge height of 27 feet. It is equipped with a tow hitch and self-leveling engine base.

The company reports that the conveyor will move from 15 to 30 tons per hour, depending on the material, loading conditions, and discharge height. The 18-inch belt has 1/2-inch

Fairfield's Model 618 portable belt conveyor will move from 15 to 30 tons of material per hour.

split cleats, with provision for raising the cleat height to 3 inches, and runs on triple-troughing idlers. The unit is available with gas or electric power.



For further information write to The Fairfield Engineering Co., Barnhart St., Marion, Ohio, or use the Request Card at page 18. Circle No. 137.

## Bros Boiler appoints two

A consultant engineer, Herbert Petzold, has joined the staff of the Wm. Bros Boiler & Mfg. Co., Minneapolis, Minn., to work on the design and development of two new Bros products, a self-propelled soil stabilizer and a tow-type in-place material preparator. He is a member of the soils committee of the American Road Builders' Association and of the Associated Equipment Distributors.

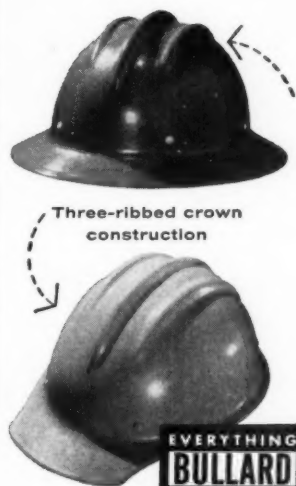
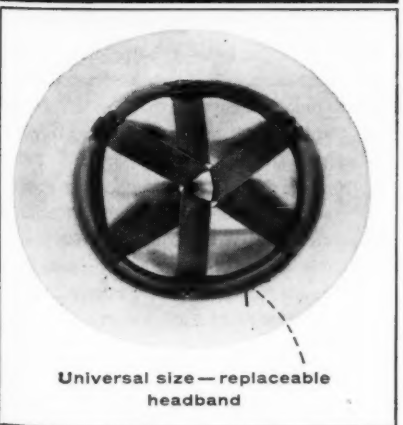
Also joining the Bros organization is Dudley Hall, who has been appointed district sales representative for the West Coast. Formerly assistant manager of the division, he will cover California, Oregon, Washington, Idaho, Nevada, and the Canadian provinces of Vancouver and Alberta.



## PROVEN BY THE REBOUND!

These Bullard engineering and sales research men are studying not only the impact, but also the rebound of this eight pound ball. Rebound action is the extra safety margin in Bullard safety hats and caps. Their scientifically designed three-ribbed crown not only resists impact but deflects heavy falling objects. This is one of the reasons why Bullard fiber glass hats and caps surpass all necessary industrial tests.

Greater protection plus style, comfort and color make Bullard head protection the best and longest lasting buy in safety hats and caps. Chin straps, winterliners and face shields are available for all styles of Bullard safety hats and caps.

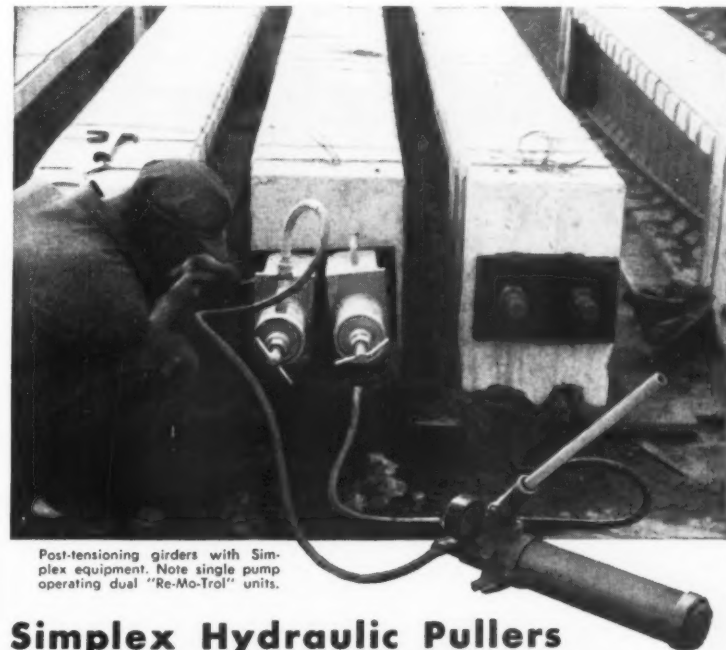


Choice of permanent molded-in colors to identify company or trade. Aluminum hats and caps available also in variety of colors.

# BULLARD

E. D. Bullard Company, 275 Eighth St., San Francisco

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Post-tensioning girders with Simplex equipment. Note single pump operating dual "Re-Mo-Trol" units.

## Simplex Hydraulic Pullers Provide Greater Efficiency in Concrete Prestressing Operations

Construction Men Acclaim Ease and Safety of Simplex Methods

Pre-tensioning and post-tensioning concrete becomes a quick, easy task with Simplex hydraulic equipment. Because of the "center-hole" pulling feature of Simplex units, wires, rods and cables can be tensioned without torque, "off center" pressures or complicated back-up devices. Eliminating these factors accounts for a 75% increase in ease and efficiency.

Simplex "Re-Mo-Trol" units consist of a "center-hole" hydraulic pulling ram connected by high pressure hose to a hand, air, electric or gasoline operated hydraulic pump. This powerful combination permits uniform stressing with maximum operator safety and speed. Once the ram is in place, the pump can be actuated safely from any nearby, convenient location.

"Re-Mo-Trol" hydraulic pullers are ideally suited to prestressing operations at the job site and for use in permanent pre-tensioning beds. These versatile Simplex units are available

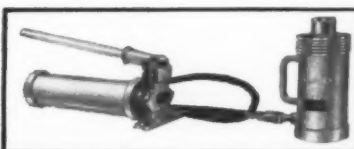
in standard capacities from 10 to 100 tons, and can be used for heavy tonnage high-pressure tensioning of cables, rods or wires or for pushing or pulling against a holding bracket in multiple bed stressing operations.

The standard Simplex units provide a range of capacities sufficient for most applications. However, custom-built units are available up to 600 ton capacity.

Another Simplex hydraulic puller, the "Jenny", is a self-contained unit which serves as its own back-up or can be used with a simple chair to reduce set-up time.

Either device can be used not only as a puller but as a hydraulic jack or press for moving heavy equipment and the like.

For detailed data on the selection and application of Simplex Pullers for prestressing concrete and other construction jobs, write for your copy of our new bulletin: "Hydraulic 56".



SIMPLEX "RE-MO-TROL"—Remote-Controlled Unit has ram connected to hydraulic pump by high pressure hose for safe, convenient use in tight spots and dangerous locations. A pressure gauge may be installed for checking tensioning pressure.

SIMPLEX "JENNY" is a hydraulically operated center-hole puller which also serves as a press or heavy duty jack. It is a self-contained unit available in capacities from 30 to 100 tons.



TEMPLETON, KENLY & CO.

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Four of the 100-foot-wide sections are partly completed inside the first and second-stage cofferdams, which were built of interlocking steel frames like those waiting on the shore. Frames were set in the water, weighted with blocks of concrete, and sheeting was driven along the outside edge.

## Six-stage cofferdam holds back Niagara as control dam is built

Extending a cofferdam out into the mighty Niagara River in six stages, each of which will enclose a 200-foot-wide and 250-foot-long area about a mile upstream from the falls, is one of the major phases of work on the Niagara Falls remedial program. Since three working seasons are required to build the Chippawa-Grass Island control structure within this cofferdam, and portions of the coffer must be left in place during the winter, sections are being built to resist not only the swift current of the river, but also the heavy ice floes that come down out of Lake Erie in the spring.

The control structure being built inside the cofferdam will extend some 1,550 feet from the Canadian shore to control the flow of the river through 13 sluiceways with hydraulically operated bascule gates. The dam will extend only to midstream, because there is relatively little flow in the shallow portion of the river on the American side.

When the control structure is completed in the spring of 1957, it will assure an adequate flow over the American falls at all times, help preserve the appearance of the upper rapids, maintain the level of Lake Erie, and provide for the maximum use of water for power development. All this work—together with other remedial works downstream at the crest of the falls—is being done under the Niagara Falls Conservation and Remedial Program, a joint effort by Canada and the United States to preserve the beauty of Niagara Falls while developing its optimum power potential. (See "U. S. and Canada Start Niagara Remedial Project", C&E, May, 1954, pg. 20.) The program was started after the Niagara Diversion Treaty of 1950 cleared the way for engineering and construction, the costs of which are being shared equally by the two countries.

### Control structure

The major part of the \$17.5 million remedial project is the Chippawa-Grass Island control structure, started in 1954, which is designed so that river flow will meet that set forth in the terms of the 1950 treaty. These call for day and evening flow over the falls to be 100,000 cfs during the tourist season. At all other times, flow is to be 50,000 cfs. Amounts available in excess of these figures are shared



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RAPID CITY, SOUTH DAKOTA • INDUSTRIAL and CONSTRUCTION EQUIPMENT

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*J. D. Evans*

**HOW LONG IS 24 YEARS?** — Ask Mr. Evans and he will tell you that 24 years is long enough to know that Barnes pumps can be depended upon for the many years of trouble-free service contractors expect from a quality pump—that every Barnes pump, large or small, is engineered and built to insure uninterrupted service.

In the wide selection of sizes and drives available, you can be sure you will find the perfect pump for your particular purpose.

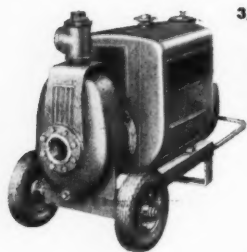
The pump pictured is a Barnes 30M standard 4-inch self-priming centrifugal, capable of delivering over 30,000 gallons per hour with 1 gallon of gasoline consumption per 33,000 gallons of water pumped.

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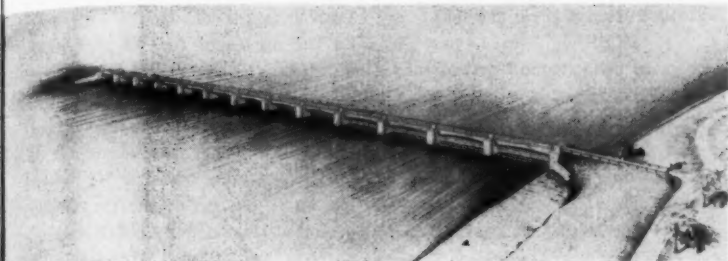
Mansfield, Ohio • Oakland 21, Calif.



*forward action in '56*

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This sketch of the Chippawa-Grass Island control structure shows the 13 bascule-type gates, each 100 feet wide, that will control the river flow.



The control structure, about a mile upstream from the falls, is expected to be in operation by next spring. Excavation, indicated by dotted lines, and fill, by solid lines, was completed on the American side, left, by the U. S. Army Corps of Engineers and on the Canadian side by Ontario Hydro.

by the two countries for power development.

The concrete portion of the dam consists of 14 piers joined by a series of 13 low weirs, each 100 feet long. Each bay is fitted with a bascule or flap gate, 100 feet long and 10.5 feet high, which is hinged at the bottom. In the open position, when the gates lie flush with the sill of the dam, they will usually permit a flow of 100,000 cfs, as required by treaty.

Hydraulic controls contained in the piers will raise the 150-ton gates to the vertical position to reduce the flow to 50,000 cfs. In this position, the gates will project about a foot above the water surface. Operation of the gates will be controlled from a station on the shore. The structure is being built with W. L. Fraser as project manager for the Hydro-Electric Power Commission of Ontario and Frank Dobson as resident engineer.

#### Unique cofferdam

Perhaps the most unique feature of the dam construction, which is being handled with forces and equipment of the Hydro-Electric Power Commission of Ontario—an organization commonly known as Ontario Hydro—is the cofferdamming method.

Each of the six stages in the cofferdam encloses an area about 200 x 250 feet. The basic elements of the cofferdam are a series of steel cribs or frames fabricated of structural steel sections. The cribs are about 10 feet long, 30 feet wide, and 15 feet high, and weigh about 7 tons each. These interlocking cribs form a frame so that H-piles can be driven into the rock bottom of the river to support the cribs. There is no overburden over the rock in this area.

Adjacent cribs interlock with a system of channel guides and rollers. When a crib is to be added to those already in place, a crane picks up the section and swings it into place so that the interlocking guides and rollers are engaged at the top of the section already in place, high above the water. As the new crib is lowered, the guides hold it in place against the pressure of the current. Before it can touch bottom, the crib is stopped by a clip angle at the desired level.

When the crib has been plumbed to within 1/4-inch tolerance, 12-inch 79-pound H-piles are inserted in

(Continued on next page)

Crushing Life  
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**Hard-  
Facing**

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**HAYNES 90 rod**



Hard-facing the rolls in this crusher rig with HAYNES 90 Rod makes them more than 5 times more durable. Two sets of rolls are used to crush rock from 3-in. down to 1/2-in. screen size. They handle up to 26 thousand tons of rock with a minimum of repairs—despite severe wear from abrasion and impact. Other hard-facing materials wore out before 5,000 tons of rock were crushed.

Since HAYNES 90 Rod was adopted as the standard material on this job, production increased, down-time was reduced, labor and maintenance costs were cut, and less hard-facing material was needed per ton of rock crushed. This is typical of the kind of savings that can be realized by hard-

facing with HAYNES alloys.

HAYNES hard-facing alloys give outstanding service when used to protect parts in crushers, shovels, tractors, trucks, conveyors, and other metal parts exposed to wear from abrasion, impact, corrosion, or heat.

Your local dealer carries a complete line of HAYNES hard-facing alloys, including: HAYNES iron and nickel-base rods, HAYNES STELLITE cobalt-base rods, and HAYSTELLITE tungsten carbide tube rods. Ask him for descriptive literature. If you don't know the location of your local dealer, write to Haynes Stellite Company, a Division of Union Carbide and Carbon Corporation, Kokomo, Indiana.

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Against the background of mist veiling the falls, workmen put down shallow blast holes while shovel-loaded Euclid end-dumps haul excavated rock from the crest.

C&E Staff Photo

(Continued from preceding page)

openings in the crib and driven into the rock bottom of the river by a McKiernan-Terry 9-B-3 hammer powered by air from a central compressor station.

The piles are then marked and cut off to exact grade by an oxyacetylene cutter mounted in a special jig. Double I-beam caps are then placed on top of the piles and securely bolted to the crib. From this point on, the H-piles support the crib, and all of the weight on the crib is transmitted to the piles.

The next step is to weigh down the crib with a floor of heavy concrete blocks. These precast blocks measure 10x3x2.5 feet, and weigh about 6 tons each. Twelve make one complete

layer over the top of the crib. Crib on the upstream face of the cofferdam receive three layers of blocks for a total of 216 tons of ballast, while those on the downstream side get only two layers, or 144 tons of weight.

Fitting snugly together, the blocks form a 30-foot wide concrete roadway on top of the cofferdam. Trucks hauling the precast blocks from place to place, cranes that set the blocks, and other mobile equipment use this roadway during construction.

With the cribs in place and ballasted, interlocking steel sheet piling is driven against wales on the outer edge of the crib. These steel wales transmit the horizontal load to the crib. The heavy steel sheet piling, which is 15 inches wide, has 7/8-inch webs and is driven into the rock by the McKiernan-Terry 9-B-3 hammer. There has been very little seepage through or under the sheathing.

Cribs for the cofferdam corners are much heavier than the standard cribs. As many as 15 or 16 H-piles may be driven in a corner crib to insure its stability.

When it was found desirable to change the elevations of the cribs, a special starter crib was used. The clip angle was adjusted to stop the next crib at any desired elevation. Since this caused a break in the floor level of the deck, a short ramp was placed to connect the two elevations.

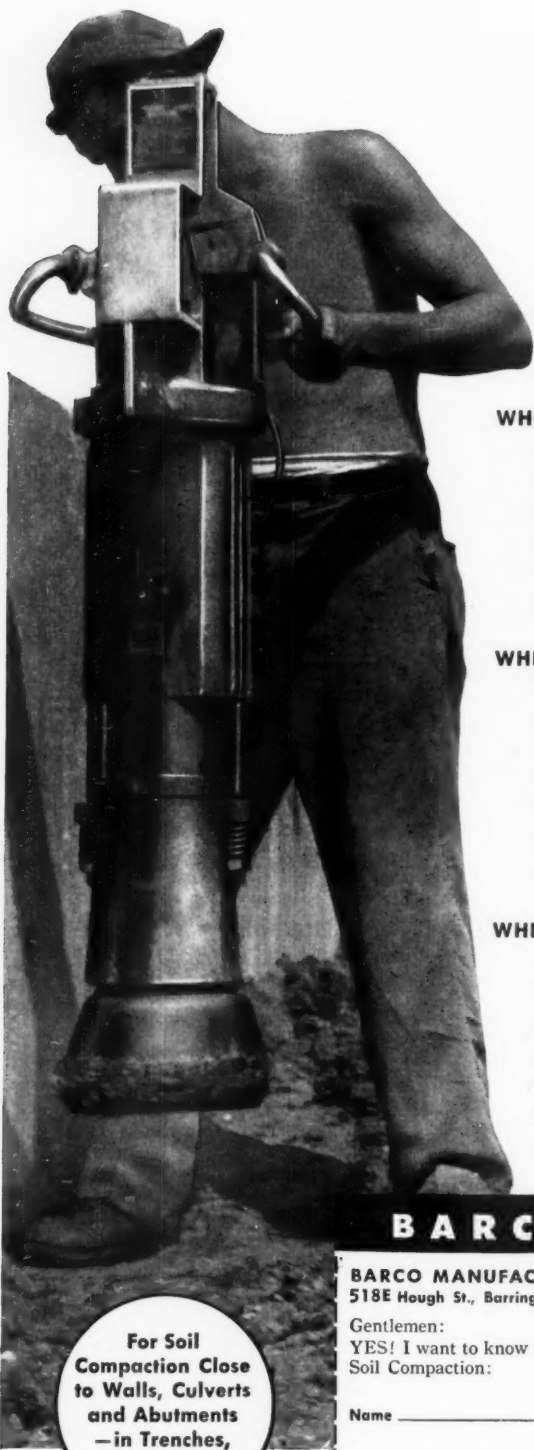
#### Use leapfrog tactics

The first stage cofferdam started at the shore and extended out far enough to include three piers and two gates. The second stage encompassed the area required for two more piers and two gate bays. When the first two bays of the dam were complete and the gates in position, the second stage of the cofferdam was tied in to the third pier of the dam.

Cribs, piling, and concrete blocks from the first stage cofferdam were

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**WHEN YOU'RE UP AGAINST A TIGHT SCHEDULE**—One of the biggest advantages offered by Barco Rammers is ability to handle work in minimum time. On area tamping, one man can average 20 to 30 cubic yards of fill per hour. On trench backfill, using lifts up to 24", the rate for 18" trench is 360 to 600 feet per hour. *When time is at a premium, BARCO PERFORMANCE PAYS DIVIDENDS*—find out about it NOW!

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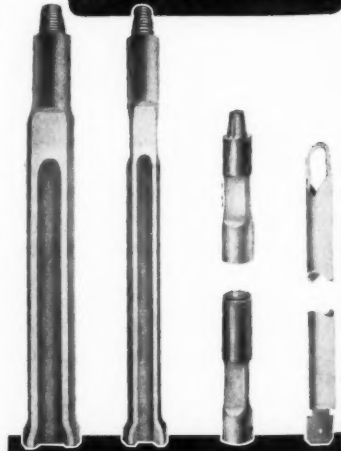
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CONTRACTORS AND ENGINEERS



then removed and used to build the third stage. In this manner, the components of each stage were leap-frogged over the intervening stage for re-use. In this way, materials from the first stage went into the third. Materials from the second stage jumped ahead to the fourth stage, then to all even numbered stages.

When one stage of the cofferdam was complete, a series of 10 and 20-inch pumps, powered by electric motors with as much as 200 horsepower, unwatered the area in five or six hours. The smallest pump easily handled the subsequent seepage.

While the excavation for the structure was being started, a grout curtain was placed inside the cofferdam. Two-inch holes were first drilled to a depth of 10 feet at 20-foot centers. Grout was pumped into these at relatively low pressure. Holes were then drilled on 10-foot centers to a depth of 20 feet and grouted under higher pressure to complete the curtain.

Wagon drills and dynamite loosened the rock to depths of from 6 to 8 feet so that footings for the towers and gate sills of the dam could be constructed. Northwest 2-yard shovels loaded the rock into end-dump Euclids which hauled out of the excavation.

Concrete for the dam, mixed in the Smith 2-yard mixers of Ontario Hydro's Whirlpool plant, is trucked to the dam in 6-yard transit mixers. Cranes using Blaw-Knox 2-yard buckets transfer the concrete to the forms at rates up to 200 cubic yards per hour. Among the cranes at work on concrete pours and other operations in the cofferdam are two crawler cranes, a 20-ton truck crane, a Manitowoc Model 3500, and two Northwest 80-D machines.

#### Prestressed concrete bridge

When the concrete dam section had been completed for one stage and the steel gates installed, a precast, prestressed concrete bridge, with a 25-foot prestressed concrete deck was built as a permanent means of access to the piers of the dam. It also serves as the access road to the outer stages of the cofferdam, now that the first-stage materials have been removed.

Cantilever arms extend 15 feet out both ways from the piers, reducing the 100-foot span between piers to 70 feet. This distance is spanned by the prestressed girders.

Girders were cast and prestressed in a yard set up near the dam site. Each of the 73.5-foot girders contains eight 1½-inch rods of 154,000-psi steel. After the concrete had cured, these rods were stressed to 100,000 psi, with a resultant elongation of more than 3 inches.

#### Remedial work downstream

Other phases of the remedial work at the falls are designed largely to keep the flow of the Niagara from eroding the crest of the cataract. In this area, some 89,000 cubic yards of rock on both sides of the river near Horseshoe Falls has been excavated so that the water will spill in a more uniform blanket over the entire crest

(Concluded on next page)

Upstream from the falls, a dike diverts water from the 8½-acre area being graded on the Canadian side of the river. Compressors of the quarry drill supply air for jackhammer drilling, which starts excavation of 3 to 8 feet of rock.

C&E Staff Photo



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MARION 372	---	43	---	---	---	---
MARION 83-M	2	60	---	---	2-2½	414
MARION 87-M	---	75	---	---	---	---
MARION 93-M	2½	80	---	---	---	397-E
MARION 101-M	3	84	---	---	---	417
MARION 111-M	4	169	---	---	---	402-B

\*Rated at 10' Radius in Accordance with General Practice.



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For more facts, use Reader-Reply Card opposite page 18 and circle No. 353

of the falls instead of being concentrated at the center, as was previously the case. Some fill was also placed on both sides to restrict incidental flows and improve the appearance of the falls.

Since cofferdamming from both sides at the same time would have restricted the flow of the river unnecessarily, work was done first on the American side. This, involving excavation of 25,000 cubic yards of rock from a 5-acre area of riverbed adjacent to Goat Island, was done by McLain Construction Corp., Kenmore, N. Y., under a contract let by the Buffalo District of the U. S. Army Corps of Engineers.

Using a daring and unusual method of cofferdamming, McLain constructed a dam of sheet piling and rock straight out from Goat Island, perpendicular to the swift current of the river, then dropped down with a wing dam to enclose the work area. This difficult project was completed in one season.

#### Canadian excavation

The excavation of 64,000 cubic yards of rock from an 8½-acre area on the Canadian side was done during the 1955 season by the construction force of Ontario Hydro. Although this work covered more area and included a larger volume of rock, there was less current and shallower water on this side.

After a dike of earth and stone had been thrown up to deflect water from the work area, excavating equipment went right to work. The rock was drilled with jackhammers to depths ranging from 3 to 8 feet and was blasted with dynamite. Shovels loaded the loosened material into a fleet of Euclid end-dumps, which hauled to the fill or waste areas.

This lowering of the crest at both extremities of Horseshoe Falls is causing more water to flow in these areas and is reducing the amount flowing over the center of the Falls. The fills built as part of these projects will provide new areas for visitors to use when viewing the Falls.

THE END

#### ACPA elects officers

Delegates to the 48th annual convention of the American Concrete Pipe Association recently elected a slate of officers to head the organization during the new association year.

Carl A. Bluedorn, president of Zeidler Concrete Products Machinery Co., Waterloo, Iowa, was elected president, and E. F. Bepalow, vice president of Chocktaw, Inc., Memphis, Tenn., was re-elected vice president. Also elected to a vice presidency was Harry W. Heath, vice president of the Lock Joint Pipe Co., East Orange, N. J.

The office of third vice president was delegated to C. M. Adams, assistant chief engineer of American Pipe & Construction Co., South Gate, Calif. John H. Bailey, secretary of Cretex Cos., Inc., Elk River, Minn., was elected secretary, while Craig J. Cain, vice president and treasurer of Continental Concrete Pipe Corp., Chicago, Ill., was elected treasurer.

#### Portable pipe bender is job-mounted easily

■ A portable tube, pipe, rod, and flat-bar bender that can be mounted on a truck, workbench, metal stand, or vise is manufactured by the J. B. Sebrell Corp. According to the manufacturer, this device can cut bending costs up to 95 per cent in certain instances.

The Sebrell 4-in-1 bender shapes steel flat-bar up to 2½ × ½ inches. It bends round and rectangular steel and reinforcing steel bars up to 1 inch in diameter and steel pipe up to 1½ inches. Steel, aluminum, and cop-

per tubing up to 1½ inches thick can also be handled.

The advantages of this portable bender, the manufacturer states, include the elimination of time, effort, and equipment in taking inaccurately-shaped pieces back to the shop for correction; elimination of the possibility of bending more pieces than are needed; and the fact that five times more unbent than bent material can be hauled.

For further information write to the J. B. Sebrell Corp., 300 S. Los Angeles St., Los Angeles 13, Calif., or use the Request Card at page 18. Circle No. 111.

#### Iowa Mfg. Co. appoints

The manufacturer of the Cedar Rapids line of aggregate-producing and bituminous-mixing equipment, Iowa Mfg. Co., Cedar Rapids, Iowa, has promoted Kenneth V. Turner to the post of assistant sales manager for the firm. He had formerly been the Dallas, Texas, district sales representative. Turner will make his headquarters in Cedar Rapids.

Howard Y. Gibson has been appointed district sales representative in Texas, Oklahoma, Arkansas, and Louisiana. He will make his headquarters in Dallas, Texas.



1 Side plates are of abrasion resistant high strength steel, securely fused to moldboard and box sections by low-hydrogen welding. They prevent load spillage, allow you to carry larger loads. Standard on all International bulldozer blades.

2 Push arms are sturdily constructed of box sections. Side plates are mill-rolled with integral back-up bars to support top and bottom plates. Machine welding guarantees uniformity of weld.

3 Headless pins, locked by eye bolts, secure struts to blade. For removal, pins can be driven out in either direction. On hydraulic blades, all control linkage is connected to the blade through self-aligning bearings.

4 Entire perimeter of blade is backed by heavy box channels solidly fused to moldboard. With this type of construction

moldboard, box channels, and welds flex freely to prevent weld failure.

5 Spillboard is wide and high to prevent spillage over top of blade. Note that it is curved to match the contour of the moldboard, thus aiding boilling action. Width of moldboard allows you to carry full load for which the blade was intended.

6 Moldboard is formed from a single sheet of low-alloy, high-strength steel. International blade is shaped to perfect curvature in a special forming machine to assure uniform strength and stress resistance over entire area.

7 Shear bars welded to moldboard support end bits and relieve stress on end bit bolts. Lower edge of end plate is reinforced by wear plate to add strength at corners, increase wear resistance.

#### New blades designed from "ground" up

To make full use of the greater work capacity of the new Bonus-Powered International crawler tractors, we now offer a complete line of newly designed blades matched to tractor power.

These new blades are rigidly supported around the edges by box sections to give the blade strength but also permit the moldboard to "breathe" under load stresses. New automatic welding processes guarantee that the welds in International blades will hold up under any kind of job conditions.

International blades will last far longer and give you far less trouble than any others you have ever hung on any tractor. When you inquire about the new line of Bonus-Powered Inter-

national crawler tractors, ask your International Industrial Power Distributor for all the facts about the new line of matching blades. See for yourself that they are the best designed, constructed on the market.

**Write For New Blade Literature:** An illustrated specification list of the 228 attachments available for International crawler tractors is just off the presses. For your free copy of Manual Folder CR-492-F, write Consumer Relations Department, International Harvester Company, 180 North Michigan Avenue, Chicago 1, Illinois. No obligation, of course.



## Revised textbook published on strength of materials

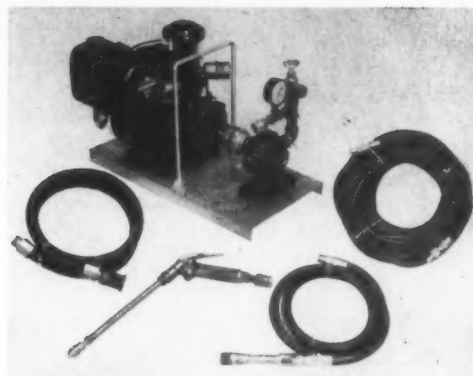
Radical changes in the usual approach to a study of strength of materials and in the organization of topics covered makes the fourth edition of "Resistance of Materials" virtually a new book.

This revised edition of a book originally published thirty years ago features an early introduction to the inelastic behavior of material. This is particularly useful in obtaining the limiting or ultimate loads on such types of members as riveted and welded joints, seams, and columns.

A more flexible treatment of combined stresses, buckling strength of columns, the use of interaction curves in solving problems involving combined loads is also included in the volume. It also has a large number of new problems and figures—many of them emphasizing the actual physical conditions met in construction projects.

Written by Fred B. Seely and James O. Smith, the book is intended for both students and practicing engineers. The price is \$6.50.

The book may be obtained from the publisher, John Wiley & Sons, Inc., 440 Fourth Ave., New York 16, N. Y.



The No. 6500 portable pump and spray unit.

## Portable spraying unit for roadside maintenance

■ A portable pump and spray unit for brush, weed, and insect control along highways is announced by the Associated Sales & Supply Co., St. Louis, Mo. The suction-operated unit is capable of pressures as high as 250 psi.

According to the company, operation of the No. 6500 spray unit is simpler than many other weed-control systems: a suction hose is dropped into the drum of chemical to be applied, and the unit is ready for operation. A compact unit, the sprayer is operated by a 3/4-inch pump powered by a 2 1/2-hp gasoline engine.

In addition to the pump and engine, the unit includes suction, outlet, and overflow hoses, and a 9-inch-long by 1/4-inch-diameter spray gun with adjustable spray nozzle. The engine and pump are mounted on a metal base equipped with a carrying handle.

For further information write to the Associated Sales & Supply Co., 5137 Southwest Ave., St. Louis 10, Mo., or use the Request Card that is bound in at page 18 of this issue. Circle No. 139.

## Basic surveying text

The fundamentals of surveying, and basic surveying procedures are detailed in "Surveying Instruments and Methods for Surveys of Limited Extent", by Philip Kissam of Princeton University.

Basic principles and theory are emphasized and required techniques are covered thoroughly in the book, which views surveying from the practical point of view. For this reason, it can be used by young surveyors for self-study.

After outlining fundamental operations, the book details procedures for line and grade for construction, optical tooling, miscellaneous operations, transit-stadia and plane-table surveying, map drawing and the keeping of records, and the use of aerial photographs. The appendix covers the double-meridian-distance method.

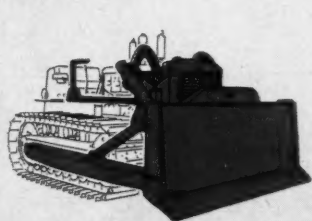
The book includes all formal surveying instruction needed for students of professions using surveying, with the exception of civil engineering students. For them, it provides a foundation on which to build later courses.

Copies of the book, available at \$5.75 apiece, can be ordered from the publisher, McGraw-Hill Book Co., Inc., 330 West 42nd St., New York 36, N. Y.

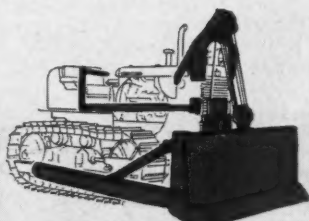
—For more facts, circle No. 354

# .42 new blades

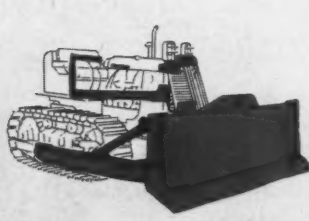
## Bonus-Powered International crawlers



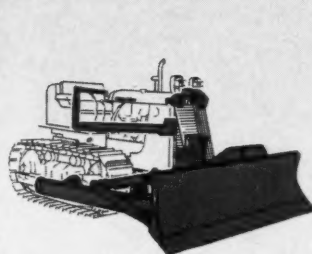
**Direct Lift Hydraulic Bulldozer**  
Operates off front-mounted, gear-driven pump which gives fast blade action. Self-aligning bearings prevent binding of linkage.



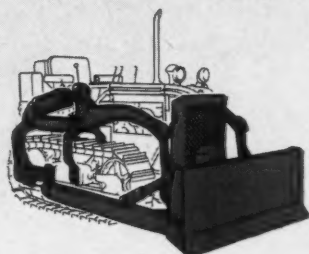
**High-Gantry Cable Bulldozer**  
Operates off either front or rear-mounted International cable control unit. Available for TD-24, TD-18, and TD-14 tractors.



**Low-Gantry Cable Bulldozer**  
Operates off either front or rear-mounted International cable control units. Available for TD-24, TD-18, and TD-14 tractors.



**Hydraulic or Cable Bullgrader**  
Operates off high or low gantry, front or rear cable controls on TD-24, TD-18, and TD-14 tractors. Hydraulic bullgrader also for TD-9, TD-6, and T-6 tractors.



**Track Frame Mounted Bulldozer**—Distributes the load evenly over the length of the tracks. Available only for TD-9, TD-6, and T-6 tractors. Bullgrader also available.



**International Drott "4-in-1"**  
Newest of International Drott loaders. Combines Skid-Shovel, Bullclam, clamshell, and bulldozer in one unit. Available for TD-14, TD-9, and TD-6 tractors.



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(Additional photos on facing page)

New York's glittering Copacabana usually has its floor shows playing to packed audiences, but one of its most unusual shows was staged when the night club was completely empty of cash customers.

The show, lasting about six weeks, involved removing the four massive columns that limited the size of the dance floor and blocked a view of the floor from some of the tables. Each of these columns was replaced with channel-shaped girders.

The club itself occupies the basement, and the Copa Lounge, the first floor of a multi-story building in the

East 60's, part of which is given over to a residential hotel. The row of four columns in the basement supported a total load of 700 tons, and they had to be removed without disrupting hotel services. The job was done as the specially fabricated steel girders were set in place, their ends resting on two new rows of columns, running parallel east and west of those to be removed, which were founded on existing cast-iron pedestals encased in concrete.

The inner two columns to be removed were 10 inches square and each supported a load of 200 tons. The outer two, 11 inches in diameter, car-

The old Copacabana, with the massive columns that obstructed a view of the dance floor, is now a thing of the past. The 700-ton load carried by the columns is now borne by channel-shaped girders spanning the floor.

## Replacing columns with girders calls for intricate load-transfer reconstruction

ried 150 tons each. Four of the eight columns that were to take the additional load were 12 feet 11 inches from those to be removed, while the other four were 19 feet 4 inches away. These eight existing columns were built up and reinforced with concrete and vertical steel I-beams to accommodate the extra strain.

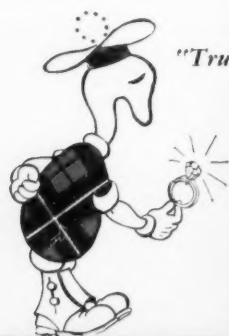
### Column replacements

Each of the columns was replaced by two channel-shaped girders, each about 31 feet long and weighing 3½ tons, which were composed of a ¾-inch web-plate and flange plates vary-

ing from 1×12 inches at the ends to 3×12 inches at the center. These were separated by 14-inch WF 34-pound beams. The column load was transferred to the girders through two 12-inch 50-pound I-beams connected to the new girders by turned bolts. Both the I-beams and the separator beams were placed with flanges vertical.

The I-beams were not placed until the cast-iron columns had been removed. Wedges were driven between a 2-inch-thick plate on top of the I-beams and another plate directly under the column flange, so that the

(Continued on page 148)



"Truly, 'tis a gem."



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ARE INVALUABLE TO  
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SPECIFY EFFICIENCY.

All steel construction.  
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Jack over axle models.  
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Tandem axle. Capacities 16 through 35 tons. Drop deck or flat deck.

**MODEL TT**

Heavy-duty tilt trailer. Capacities 6, 8 and 10 tons.

**A TRANSPORT TO FIT EVERY NEED... BETTER\***  
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Single axle flat bed semi, capacities 10 through 20 tons. Drop deck or flat deck.

**MODEL GPR**

Removable gooseneck. Tandem, triple or trunnion axles. Flat or drop decks, or as beam trailers.

**MODEL GTX**

Triple axle, 6 dual wheels. Capacities 25 through 45 tons. Flat or drop deck.

**MODEL T-8-18**

14 or 18 foot length between the wheel tilt trailers. 8-10 ton capacity.

**MODEL PS**

Single axle, spring mounted platform or float.

**MODEL PX**

Heavy-duty tandem axle, spring mounted platform or float.

**MODEL KSO-D**

Dual axle drop bed semi, capacities 15 through 30 tons. Drop deck or flat deck.

**MODEL MSO-D**

Multiple axle drop bed semi, capacities 35 through 75 tons. Drop deck or flat deck.

**MODEL GXTT**

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CONTRACTORS AND ENGINEERS





◀ A pipe bolster filled with concrete provides a jacking surface for the cast-iron column on the first floor. Bracing in four directions eliminates the chance of a column jacking after all floor beam connections to the basement columns are removed.



The column load has been transferred directly to the double channel-shaped girder in the basement below by a 12-inch I-beam section, placed under the column and bolted to the girder webs. A billet plate and wedges between the plate and the column flange have been welded. ▶

(Article starts on facing page)

The girder, supported on each end by two existing columns that were built up with vertical I-beam sections, supports the column load. The load originally extended down to the cast-iron base through the basement column. ▼



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WIRE ROPE CUTTER**



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No jagged ends. The wire rope is cut with ends smooth and clean for perfect threading or splicing.

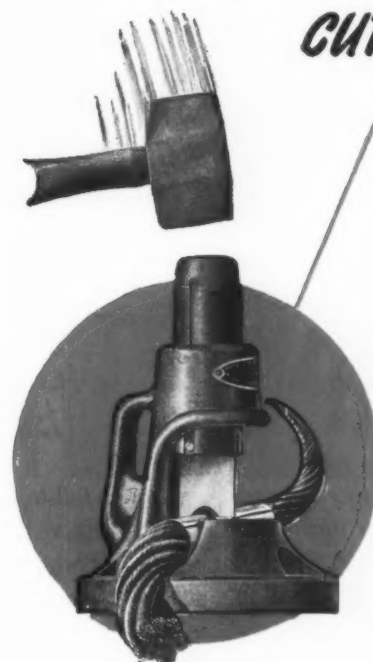
**SAFER . . .**

The enclosed cutting blade locked in the body of the cutter assures perfect safety.

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**PORTABLE..**

Models for tool kit or stationary operation. With cutting capacities up to: 1 inch, 1 1/16 inch, 1 1/2 inch.



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For more facts, use Reader-Reply Card opposite page 18 and circle No. 358

(Continued from page 146)

load could be transferred. Each end of the girders was supported by a new steel column that used as its base the existing cast-iron pedestal that supported the columns directly to the east and west of the ones to be removed. This design for the removal of the columns was prepared by Weinberger & Weishoff, New York, N. Y., and the actual job of transferring the load from columns to girders was handled by Spencer, White, & Prentis, Inc., New York City.

#### Small working area

The job started on the date scheduled, workmen moving in as soon as the last customer had left the club early in the morning. By 8 a.m.,

chairs, tables, and other furnishings had been removed from the club, giving men a little more room to work in.

A 4x6-foot hole was then made in the wall separating the basement level from a stairway leading to street level so that material and equipment could be slid into the club on a temporary timber ramp. The following day, some furnishings in the street-level Copa Lounge were removed and a 4-foot-wide strip of the first floor was opened to provide enough clearance for the new girders to be lifted into place.

Concrete encasing the old columns was then removed with chipping tools and air hammers supplied with air by a portable compressor located outside the building. The cores of these columns were of cast iron and were located on pyramid-shaped cast-iron

bases which, in turn, rested on concrete beds extending from rock a few feet below floor level to a few inches above floor level.

Since it was impractical to weld brackets to cast iron so that columns could be jacked—the strength of such a weld being uncertain—the columns were encased in bolsters. These 5-foot-high bolsters consisted of semicircular sections of 30-inch-diameter steel pipe, welded together in the shape of a barrel, and encompassing each of the columns to be jacked. When they were securely in place, they were filled with a special mix of 4,000-pound concrete containing a small amount of Embecco that expanded the concrete as it set.

When sections of the first floor had been chopped along the line of the

columns, and the bolster placed, four 6-inch 20-pound H-beams were used to brace bolsters in both directions, eliminating any chance of a column jacking after all floor beam connections to the basement column had been removed. This bracing was a few feet above the level of the first floor. Five-inch I-beams were embedded between the top of the bolsters and the column flanges at second-floor level as an additional safeguard against any movement between the column and bolster.

#### Load is transferred

At this point, when only the existing floor framing beams blocked the openings, the steel girders were delivered to the job and placed in position on the basement floor alongside the columns. The floor beams, supported by 8x8-inch timber shores, were then cut to provide a clear opening so that girders could be raised.

Girders were raised into place in pairs with the aid of chain hoists attached to a framework of 12x12-inch timbers. When they were in position on both sides of each column to be removed, the new columns, were placed on their base plates and the girders were lowered to bear on clip angles welded to the new columns.

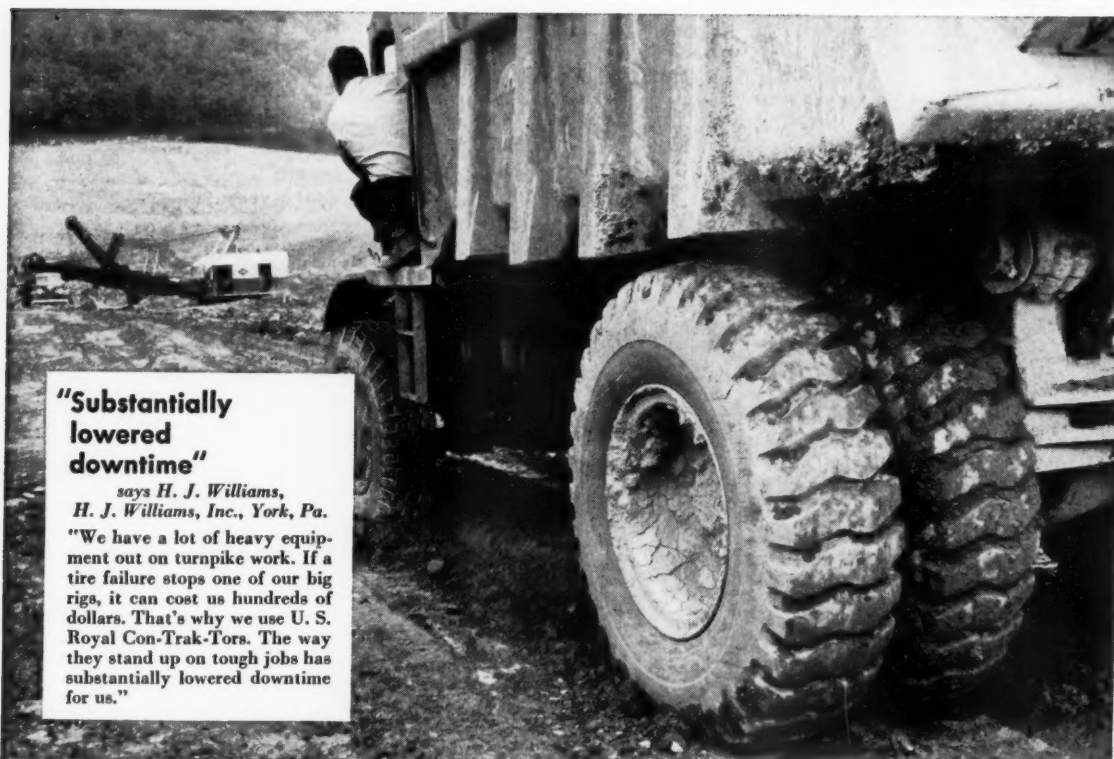
Once girders had been set and bolted to the new columns, and before the jacks were set to lift the first floor columns, a 1-inch grout hole and a 1/4-inch vent hole were drilled through the columns above the top of the bolster to permit the hollow columns to be grouted so as to increase their resistance to cracking. As an additional safety measure, four 10-inch pipe columns, resting on timber mats, were installed at each column location just clear of the bottom of the new girders. These temporary columns were to pick up the load should any part of the system fail while the load was being transferred to the new steel.

Four hydraulic screw jacks were then set on the top flange of the girder, as close as possible to the web plate, so that the jack pushed against the 1-inch steel plate on the bolster.

As the load was being transferred, a careful check was made of the deflection of the girders, or any movement that might take place either in the new columns or in the columns to be removed. Jacking pressure was applied slowly, until the weight above the column was transferred directly from its base to the new bridging girders. The columns were raised a total of 1/16 inch to make sure that the load was being carried by the new girders. A heavy billet plate was placed on top two 12-inch 50-pound I-beams, which were positioned and bolted between the twin girders after the basement column was removed. Wedges were then driven between the billet plate and the column flange to transfer the column load directly to the 12-inch I-beams. With the column load transferred to the girders, the pressure on the jacks was released, and the column was found to have lowered 1/32-inch. Wedges and plates were then welded to insure against further movement.

The cast iron columns were removed

## Costly Downtime Drops!



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says H. J. Williams,  
H. J. Williams, Inc., York, Pa.

"We have a lot of heavy equipment out on turnpike work. If a tire failure stops one of our big rigs, it can cost us hundreds of dollars. That's why we use U. S. Royal Con-Trak-Tors. The way they stand up on tough jobs has substantially lowered downtime for us."

Approach to south portal of T. J. Evans Tunnel, on the Pennsylvania Turnpike near Allentown.

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**CON-TRAK-TOR**  
**FULL LUG**

If, like Mr. Williams, you use heavy-duty trucks, you can reduce your equipment downtime and your operating cost with the U. S. Royal Con-Trak-Tor. Here is why.

This tire's *Nylon cord carcass* stands up to vicious shocks, fights off sharp rocks and snags. It has *triple impact protection*—extra cushioning rubber between plies, double shockpads under the tread, extra-tough construction at the crown.

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Your U. S. Royal Dealer now has the U. S. Royal Con-Trak-Tor in your size. Have him put it on your wheels—and prove to yourself why men like H. J. Williams report that both downtime rates and operating costs *drop* with this great tire!



## United States Rubber

For more facts, use Reader-Reply Card opposite page 18 and circle No. 389





The new Copacabana—where every table in the club commands a good view of the dance floor.

by cutting a diagonal slot at the center of the column, allowing the top half to slide free. Floor beams were finally attached to the new girders by welding 4-inch WF 13-pound beams to the web of the girder, then welding the bottom flanges of the floor beams to the top flanges of the 4-inch beams.

Workmen completed the job by concreting the slots in the first floor and replacing protection brick around the existing wall columns with concrete. As a final touch, the new steel was encased in vermiculite, for protection against fires, after it had been given a field coat of paint. Then, their job done, workmen moved out to make way for the decorators responsible for the club's lavish refurbishing.

THE END

### Book treats structural design of buildings

A revised edition of "Applied Structural Design of Buildings", first published in 1949 by F. W. Dodge Corp., New York, N. Y., has been enlarged to include recent changes in building technology and additional material suggested by readers of the first edition.

A handbook rather than a textbook, it is designed primarily for architects, structural engineers, licensed applicants and draftsmen; and it assumes that the reader has a knowledge of the elements of physics, mechanics, materials of construction, and structural theory. A practical office manual containing standardized procedures for solving design problems, the book uses certain generally accepted code regulations, such as the 1946 AISC code for structural steel and the 1951 ACI code for reinforced concrete, even though these are not recognized by many local codes.

Processes that will serve the structural designer as the best working tools are presented in simple, convenient form. Short cuts, tables, design methods and formulas, and sketches accompany the data, all of which has been tested and proved reliable.

The book is divided into eleven sections, covering general principles, simple stresses and elastic theory, moments, steel in bending, reinforced concrete in bending, timber and other materials in bending, columns, foun-

dations and walls, connections, complex structures, and office practice.

Written by Thomas H. McKaig, consulting engineer and member of the New York State Board of Examiners for Professional Engineers and Land Surveyors, the 442-page volume is priced at \$12.50. Copies may be ordered from the publisher, 119 W. 40th St., New York 18, N. Y.

### Napco division news

Robert L. Wicker, sales manager of the Federal Motor Truck Division of Napco Industries, Inc., Minneapolis, Minn., has assumed the additional responsibilities of sales manager of the firm's construction equipment division. Wicker will be assisted by Orv Reynolds.

## C & D Movall--Pictorial Proof of Versatility



**FEEDS LIMESTONE INTO HOPPER** at controlled rate for Cia. Peruna de Cemento Portland, Atacongo, Peru. Operator controls discharge rate from tractor seat, stops ejector when 8-yard crusher is full. Here two 25-yard Movalls, powered by Cat DW20 tractors, replace six 8-yard side-dump trucks.



**SPREADS PERVIOUS FILL IN 18" LIFTS** at Santa Felicia Dam in California. Movall dumps behind wagon tires, safely at any speed tractor can travel because dozer-type ejector keeps center of gravity low. Depth of spread is uniform, controlled by speed of tractor (4" at 20 mph., 18" at 3 mph.). Movalls also can dump while turning at end of road fill, thus retaining fines on top.

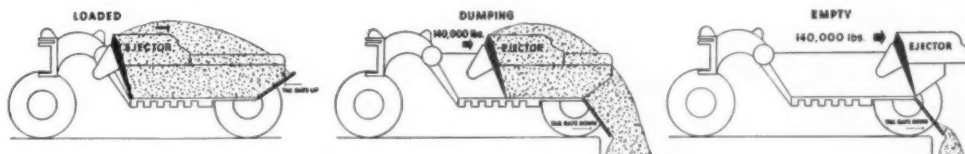


**DUMPS OVER EDGE OF FILL** with tractor either straight ahead or jackknifed. Drive wheels are always on good footing; center of gravity stays low. Positive ejection with 140,000-lb. push enables Orlando Construction Co., to dump 25-yard load of rock and dirt in 12-14 seconds on Massachusetts Turnpike. Movalls dump cleanly and quickly any material you can top load.



**DUMPS ON GRADE** safely from any position or on any level. Load is pushed straight back by 140,000-lb. push of dozer-type ejector. There's no raising of load, no danger of wagon tipping or damaging mechanism. Frozen earth and rock being dumped here on St. Lawrence Seaway by C. A. Pitts, Ltd., was loaded by 6-yard shovel.

### HOW IT WORKS



For more facts, use Reader-Reply Card opposite page 18 and circle No. 359

Movalls are easily interchanged with scrapers. Two sizes: Heaped 25-yd. for DW20 and DW21; heaped 16-yd. for DW15 and DW10 tractors. Interchangeable yokes permit use with various prime movers. **BUY AND TRY**—Ask your Caterpillar-C & D dealer for a demonstration NOW, or write C & D Division, Yuba Manufacturing Company, Perkins (suburb of Sacramento), Calif. Phone: GLadstone 5-8592.

## Detroit Diesel associate named to ARBA committee

D. J. Clymer, a member of the staff of the Detroit Diesel Engine Division of General Motors Corp., Detroit, Mich., has been appointed to the publicity committee for the 1957 Road Show of the American Road Builders' Association. He succeeds Jim Brown who has resigned from the post.

Mr. Clymer will work with Harvey A. Scribner, chairman of the committee.

## N. Y. Civil Service exam

A Civil Service examination to fill fourteen vacancies as assistant civil engineers (design) will be given by the

New York State Department of Public Works on June 23. The appointees will perform the necessary computation and design for all types of bridges, grade separations, canal projects, and other structures. Salaries start at \$5,660, with annual increases to \$6,940.

Any qualified citizen of the United States may apply. Candidates must have a master's degree in civil engineering and one year of civil engineering experience or a bachelor's degree and two years' experience. High school graduates may qualify with six years of appropriate experience.

Applications will be accepted until May 25 by the Recruitment Unit, New York State Department of Civil Service, Albany, N. Y.

## Twin diesels, providing total of 416 horsepower, drive giant new wheel-type push tractor

■ A big new two-engine wheel-type tractor boasting a total of 416 horsepower and speeds up to 20 mph has just been announced by LeTourneau-Westinghouse Co. Said to be the biggest, fastest, and most powerful tractor yet built, the new Model Twin-C is designed primarily to push-load large self-propelled scrapers.

A number of design features com-

bine to give the tractor maximum pulling and pushing power from its synchronized twin diesels, according to the manufacturer. The 6-foot-high 29.5 x 29 tires provide 2-foot 5-inch-wide ground-gripping traction at each wheel to take advantage of the tractor's weight (more than 40 tons). All four wheels are drive wheels with equal weight distribution on each.

With speeds of 20 mph forward and 5.8 mph in reverse, the Twin-C matches the pace of self-propelled scrapers, and can move fast in either direction. Instant-response electric controls give the huge machine positive power steering, and also power a unique floating push bowl.

This bowl, said to be a pushing innovation, measures 4 feet high and 7 feet wide, and incorporates a special spring-loaded mounting which automatically smooths contact between tractor and scraper. Absorbing shock, it prevents jolts from being transmitted along the frames of scraper or pusher. According to the company, this not only offers protection to equipment but provides an extra measure of operator comfort—thus contributing a significant increase in the over-all speed of the loading operation.

Dual engine power is completely synchronized with air and electric controls, making the Twin-C easy to operate. A touch of a single hand throttle operates air-pressure controls which tune the engines to exact matched speeds. Moving a single lever



Two of the fleet of 28 Euclid 46TD 22-Ton Dump Trucks equipped with Fuller 10-F-1220 Transmissions, and operated by Nello L. Teer Company, Durham, North Carolina.

## Fuller 10-Speed Transmissions handle Teer's tough hauling assignments

The Nello L. Teer Company of Durham, North Carolina, handles tough hauling assignments with Euclid 22-Ton Dump Trucks equipped with Fuller 10-F-1220 Transmissions.

On the boulevard construction job shown above, approximately 3,000,000 yards of dirt and rock were removed to add 80 feet to the present highway along Ohio River bluffs so steep that in many places a triple-bench system was necessary.

Says George Walker, Teer's Master Mechanic: "The heavy-duty Fuller Transmissions paid off in much faster work cycles. We get more work time and less downtime through the right gear ratios provided by Fuller to meet load and grade with shorter, easier shifts."

More equipment owners and users specify Fuller than any other transmission. From the 110 models, semi-automatic and full-manual control,

for trucks from 100 to 400 hp, engines from 330 to 1440 cubic inches, select THE Fuller Transmission designed to do your job better and at less cost . . . ready to help you move more for less. Check with your local truck dealer for the *right* Fuller Transmission for your job.



FULLER MANUFACTURING COMPANY  
TRANSMISSION DIVISION • KALAMAZOO, MICH.

Unit Drop Forge Div., Milwaukee 1, Wis. • Shuler Axle Co., Louisville, Ky. (Subsidiary) • Sales & Service, All Products, West. Dist. Branch, Oakland 6, Cal. and Southwest Dist. Office, Tulsa 3, Okla.  
For more facts, use Reader-Reply Card opposite page 18 and circle No. 360

**PORTABLE ELECTRIC POWER**  
*Right on any job!*  
with **Katolight**

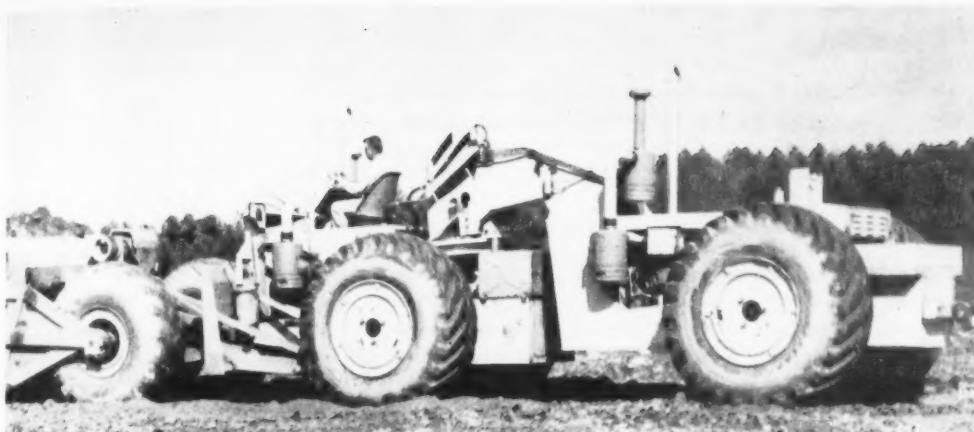
## PORTABLE POWER PLANTS

Right — you save time . . .  
Right — you speed work . . .

because with Katolight Portable Power Plants, your crews have "plug-in" electricity instantly available to operate all types of tools, equipment and lights **right** on the job, whether it's highway, or light or heavy construction. Sizes and models, **right** for every portable, standby or continuous use, from 350 watts to 50 KW, AC. Up to 500 KVA on request.

**It's New!** WRITE FOR FREE FOLDER ON NEW LIGHTWEIGHT PORTABLE MODELS  
**Katolight** CORPORATION  
Box 891-8, Mankato, Minnesota  
For more facts, circle No. 361  
**CONTRACTORS AND ENGINEERS**





LeTourneau-Westinghouse Co.'s big new Twin-C wheel tractor is designed especially for heavy-duty push-loading.

on a conventional selector shifts both transmissions simultaneously. The big multiple-disk four-wheel air brakes are controlled by one operating pedal.

Articulated steering which allows all four wheels to apply maximum pushing or pulling power even in the tightest turns is controlled with a fingertip switch on the instrument panel.

Automatic power-transfer differentials at front and rear of the Twin-C match pull to traction. In sand, mud, and loose materials, this exclusive-design differential instantly and automatically transfers the bulk of the power from the engines to the wheels with the best footing, according to the manufacturer.

The Twin-C's power is supplied by two GM 6-71, 208-hp diesels. Transmissions are LeTourneau-Westinghouse air-actuated constant-mesh units teamed with single-stage torque converters.

For further information write to the LeTourneau-Westinghouse Co., 2301 N. Adams St., Peoria 2, Ill., or use the Request Card at page 18. Circle No. 154.



### BIG GUILLOTINE THE NEW WACHS POWER PIPE SAW

No Flame—Safe Cuts Under  
Hazardous Conditions!

**FASTER—SAFER—ACCURATE!**

Cuts 10", 12", 14" & 16"  
Cast Iron and Steel Pipe

#### WACHS BIG GUILLOTINE SAW FACTS—

- Cuts Fast
- Cuts Clean
- Cuts Square
- Set up time, several minutes
- Power—electric or air motor
- Weight 312 pounds
- Height 31"
- Width 31 1/2"
- Depth 14 1/2"

Power Pipe Cutters from 2 inch to 6 Foot Capacity

For further information write to:

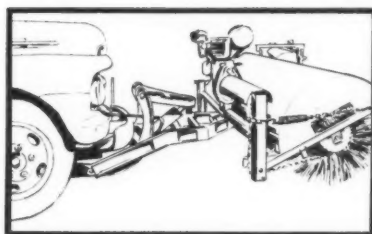
**THE E. H. WACHS COMPANY**  
1525 N. Dayton Street • Chicago 22, Illinois

For more facts, circle No. 362

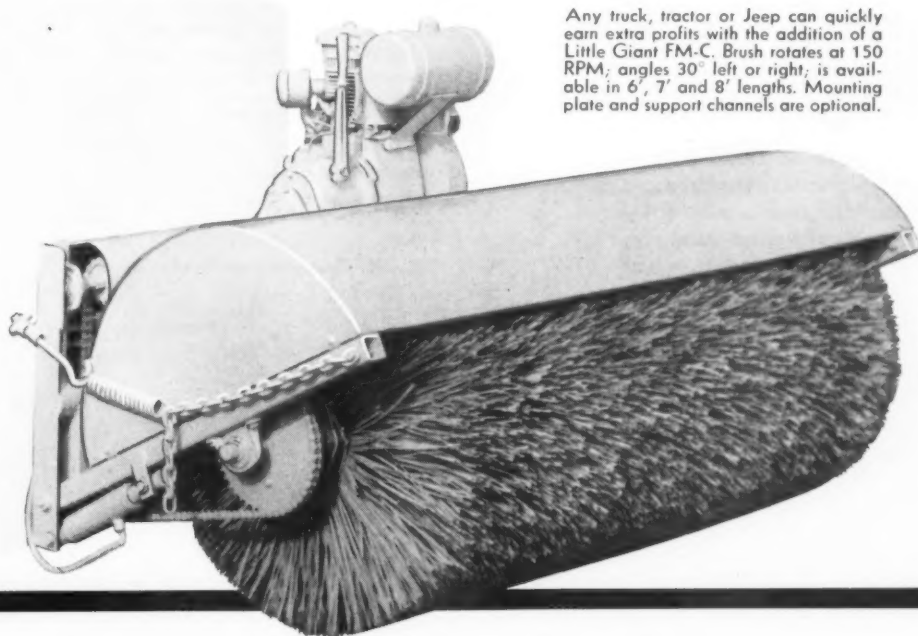
### Aluminum railings

■ Alcoa aluminum highway railings are featured in a catalog from the firm. Advantages of the Alcoa railings and engineering and architectural considerations are discussed. Models of parapet and panel railings are pictured and diagrammed, as well as the railing components—round, rectangular, and elliptical tubular rails; balusters; extruded posts; rail and post caps; fasteners; and post bases. Specifications for design, construction, and materials are also included in the literature.

To obtain this catalog write to Aluminum Company of America, 1501 Alcoa Bldg., Pittsburgh 19, Pa., or use the Request Card at page 18. Circle No. 50.



Any truck, tractor or Jeep can quickly earn extra profits with the addition of a Little Giant FM-C. Brush rotates at 150 RPM; angles 30° left or right; is available in 6', 7' and 8' lengths. Mounting plate and support channels are optional.



Another profitable use for your truck, tractor or Jeep . . .

## THE NEW LITTLE GIANT FM-C FRONT-MOUNTED SWEEPER

►With a simple mounting attachment and a Little Giant FM-C Sweeper, you can convert any truck or industrial tractor into an efficient, low-cost sweeper. The brush is driven by an economical Wisconsin AEN gasoline engine; speed of brush rotation is adjustable independently of speed of prime mover.

The prime mover retains all of its maneuverability: low sweeper weight keeps the unit in perfect balance. Brush tilt and angling adjustments are easily made by one man.

With no PTO to connect, the FM-C sweeper can be attached or detached in a few minutes. Brush can be raised by the hydraulic sys-

tem of truck or tractor, or the optional Little Giant hand hydraulic pump can be furnished.

Mount this NEW 6, 7 or 8 foot sweeper on your truck or tractor and increase your profits with the low-cost Little Giant FM-C Sweeper. Write direct for the name of your Little Giant distributor.



**LITTLE GIANT PRODUCTS, INC.**

1530-50 N. ADAMS ST. • PEORIA, ILL. • PH. 3-4515

For more facts, use Reader-Reply Card opposite page 18 and circle No. 363

# Producing cooled concrete

... with ice proves effective on small project;  
total of 36.5 tons of ice is used for 850-yard job

Now that daily temperatures are getting higher and higher, contractors planning to place concrete are turning their attention from ways to heat concrete to ways of keeping it cool so that excessive shrinkage will be avoided as the material sets. One of the most elaborate setups used during the hot months of last year's extremely hot summer was that used by the contractor on Table Rock Dam in Missouri. A refrigeration plant was used to cool water and aggregates; refrigerated water and flake ice were used in the mix; and cold air circulated through aggregate stockpiles. A simpler method of cooling concrete worked just as well for the Warner Co. of Philadelphia, Pa., a supplier of ready-mix concrete, for a smaller job in Philadelphia, where a foundation for a 500-foot-high and 20-foot-diameter concrete chimney was placed during some "dog days".

During this work, concrete temperatures in the 80's were common, and there were some instances when the concrete temperature went to the 90's. When these conditions were encountered, additional water was added to the concrete to take care of the higher recession in slump. Most concrete is sold on a strength basis, and test cylinders indicated that the additional water had little or no effect on the concrete. It seemed fair to assume that this extra water was dissipated by evaporation or some other means and did not enter into the water-cement ratio.

A total of 850 cubic yards of 3,000-psi air-entraining concrete was used on this job, all of which required a 35-minute haul to the site. It was feared that the mass of the concrete, combined with temperatures of concrete being delivered to other areas of the site, would result in excessive shrinkage to the concrete, and so a study was made of means of reducing the temperature of the material.

## Cooling methods

All cement going into concrete supplied to this job was tested by an independent testing agency, and a limit placed on the temperature of the cement. Even under the fairly liberal limit of 160 degrees F, which the plant used last year, it was difficult to maintain this temperature during periods of high production. And the limit could not be reduced without drastically interfering with the available amount of cement.

Actually, the heat of the cement would not have had very much effect on the temperature of the concrete, due to the low specific heat of the cement and the relatively small quantity used in the mix. It was calculated that a 30-degree drop in the temperature of the cement would only drop the temperature of the concrete by 3

degrees. The aggregate—a blend of 2-inch to 1, and 1-inch to No. 4—could have been cooled by sprinkling. The 2-inch material had a greater tendency to dry out because of the higher void content. This material benefited most by being wet. Since the

sand generally has a moisture content somewhere between 2 and 4 per cent, it was not practical to lower the temperature by adding more moisture to the material. All this limited the means of cooling the concrete to adding water to the mix. And since

cooling had to be done on short notice, making the installation of refrigerating coils in the water tanks impractical, water was added to the mix in the form of ice.

At first, 100 pounds of ice was used per yard of mix, and this created the

# TEAMMMMER

IN EVERY AUSTIN

**Motor graders** have come a long way since their first crude beginnings; and in the modern Austin-Western Power Grader many important features are teamed-up to give performance other graders cannot hope to equal.

Graders need great ...

## MOBILITY

... so Austin-Western provides ...



... All-Wheel Drive, giving tremendous climbing power to the front drivers, with a "live" front end that drives its own weight; instead of a dead front end that has to be pushed around by the rear drivers. All-Wheel Drive results ...



... in tremendous load-moving ability by applying more power at the blade—in all materials, and under all operating conditions—power that is made still more effective by Torque Converter drive.

## MANEUVERABILITY

is needed, too ...



... and with All-Wheel Steer, Austin-Western graders are twice as maneuverable as those with front-wheel only; steering that lets you "swing that rear end" handling every job with maximum efficiency.

## BLADE

## MANIPULATION

is another important factor ...



**The Extreme Blade Reach;** a plus benefit on many jobs such as finishing without leaving tire marks.

**The High Lift Blade;** for handling any degree of slope from flat to vertical.

**The Precision Sideshift of the blade;** for keeping the blade under perfect control at all times.

**The Completely Reversible Blade;** for those situations when it is necessary or desirable to grade in

# The Power Graders That Have Everything



problem of getting a sufficient amount of ice to the batching floor and into the mixer in as short a time as possible. Arrangements were made with a local ice company to have a refrigerated truck on hand to store the crushed ice which was delivered in 50-pound paper sacks.

Two men were detailed to unload the ice as needed and hoist it up to the batching floor. There, three other men were needed to unload ice from the hoist, open the bags, and dump the ice into the mixer through a chute usually used to introduce dry admixtures directly to the mixer.

The size of the concrete batch was

6 to 6½ cubic yards, and the handling of 600 to 650 pounds of ice per batch cut the production of concrete approximately 20 per cent at peak periods. Care had to be used so that the ice would not jam as it was charged down the narrow opening in the mixer. This was an extremely important part of the operation, since the ice started to melt and had a tendency to stick to the sides of the chute.

An air-entraining agent was used as an admixture to produce the concrete called for by the specifications. Plastiment was also used as an admixture to improve the workability of

the concrete, retard the rate of set, and help reduce the heat generated by the hydration of the cement. Plastiment was used at the rate of 1 pound per sack of cement for the first 18 inches of the foundation, ¾ pound per sack for the next 3 feet of the pour, and ½ pound per sack for the balance of the pour.

Judging the slump of the concrete as it left the mixer was complicated by the fact that all the ice failed to melt before the mix was discharged. The slump was taken as the concrete went into the truck, and, in many instances, there was no recession in slump on the job due to the 35-min-

ute haul. In some cases where the ice melted during the haul, an increase in slump was found. The normal recession in slump for this length of haul in the summer months is at least 1 inch. The only alternative that would have provided a better measure of slump control was to wait until all the ice had melted in the mixer and the water was completely incorporated in the concrete.

#### Concrete temperatures

It was found that the temperature of concrete reaching the job in the morning with 100 pounds of ice per yard was less than required, and the amount of ice added per yard was reduced to 50 pounds. As the heat of the day increased, the amount of ice going into the mixer was increased to 75 pounds per yard.

Throughout the work, the rate of pour varied from a maximum of 115 cubic yards per hour to the 34 cubic yards per hour that was placed when the job was topping out. Altogether, 36.5 tons of ice was used to cool the 850 cubic yards of concrete placed.

The temperature of eight loads of concrete taken at the plant averaged 72.3 degrees F, and on the job these same loads averaged a temperature of 78 degrees F. During the hottest part of the day, ice kept concrete at the plant nearly 20 degrees cooler than the surrounding temperature.

While work was in progress, checks were made on other jobs using concrete produced without ice, but with the same sources of aggregates and cement. Concrete turned out for these jobs was about 5 degrees cooler than the surrounding temperature.

The results show clearly that the addition of ice to the mix alone can effectively cool concrete. But if a considerable amount of concrete must be produced, it would be well to investigate the use of refrigeration coils for cooling purposes.

THE END

*From a paper presented at the recent annual convention of the National Ready-Mixed Concrete Association, Chicago, Ill., by Harry Irwin, concrete engineer, Warner Co., Philadelphia, Pa.*

#### Book of legal problems from engineering field

A new book, "Legal Problems in Engineering", by Melvin Nord, presents discussions of this phase of the law affecting contractors or engineers. Chapters are devoted to contracts, negotiable instruments, sales, real property, and labor law. Actual cases illustrate each subject.

Priced at \$7.50, the book is available from John Wiley & Sons, Inc., 440 Fourth Ave., New York 16, N. Y.

#### Alco appoints two

The new manager of the Dunkirk, N. Y., plant of Alco Products, Inc., Schenectady, N. Y., is Thomas L. Ward. With the firm since 1937, he has been associated with the Dunkirk plant in various executive capacities since 1953. He succeeds W. L. Larson, who has resigned.

L. W. Eger succeeds Ward in his former position as manager of manufacturing services.

—For more facts, circle No. 364

# ETO OUTPERFORM

## STINWESTERN POWER GRADER

### MANAGEMENT

... or control—of the machine is also important, and Austin-Western provides ...

... teams up with All-Wheel Drive and All-Wheel Steer so that all work together to move more material—and in more places. The working together of these three features—mobility, maneuverability and blade manipulation—is called ...

### CONTROLLED TRACTION...

... with the rear end swung to either side, although the grader moves straight ahead. All-Wheel Drive and All-Wheel Steer team up with the blade—so that the rear drivers push behind the toe of the blade—and the front drivers pull ahead of the heel of the blade; and the Austin-Western grader moves straight ahead—under perfect control—with no side slip. Whatever the material, Controlled Traction moves more of it—faster and further.

Yes, every Austin-Western Grader has four BIG "M" features that are teamed to outperform ... the extreme mobility and earth-moving ability provided by All-Wheel Drive and the Torque Converter ... the extraordinary maneuverability resulting from All-Wheel Steer ... the unusual versatility of blade manipulation ... and the easy management of all functions by full hydraulic control.



... Full Hydraulic Control—finger-tip management for instant response and precision operation. There's no lost motion—nothing to tire the operator. It's this hydraulic operation that makes Austin-Western graders so easy to manage. Now, the Blade Action ...



**Austin-Western**  
Graders • Motor Sweepers  
Rollers • Hydraulic Cranes

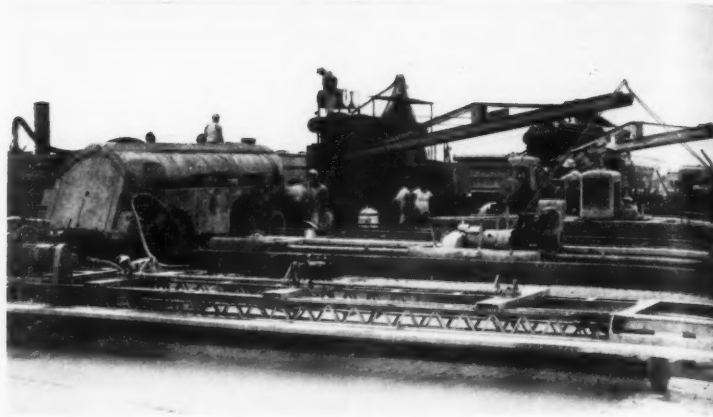


Manufactured by  
**AUSTIN-WESTERN WORKS**  
CONSTRUCTION EQUIPMENT DIVISION  
Baldwin-Lima-Hamilton Corporation  
AURORA, ILLINOIS

Construction Equipment Division



NELSON RIVWELD STUDS secured the corrugated aluminum sheeting for this storage warehouse in Long Beach, Calif. Studs were welded to the steel framework, and sheeting impaled over the studs. For details circle No. 160 on card at page 18, or write to **Nelson Stud Welding Division**, Gregory Industries, Inc., 2715 Toledo Ave., Lorain, Ohio.



OPERATED BY ONE MAN and riding the forms or adjacent slabs behind the longitudinal finisher, the Vibro-Joint cutter lowers a vibrating cutter bar into the concrete, parting the aggregate in the joint area. Joint sawing is thus simplified. For details circle No. 161 on card at page 18, or write to **Vibro-Joint Co., Inc.**, 1104 Main St., Dallas 2, Texas.

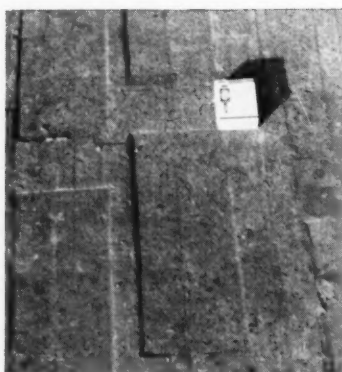
## K-45 Kompactor compacts California 399



for Guy F. Atkinson Company on \$1,736,000  
Ventura-to-Ojai highway construction job

To meet density specifications and speed compaction, Guy F. Atkinson Company of South San Francisco, California, uses the Buffalo-Springfield K-45 Kompactor on this

Material before compaction on the Ventura-Ojai highway job. (Pack of cigarettes shows comparative size.)



After 3 passes by the K-45 Kompactor. Note surface uniformity. (Cigarette pack for comparison.) Density specifications also have been met in record time.

project between Ventura and Ojai, California.

Operating at fast speeds, 4 to 5 mph, the self-propelled, highly maneuverable K-45 cuts compaction

time substantially from that normally required. It further shortens time by giving compaction to meet specified densities with fewer passes.

The K-45's "Interrupted Pressure Principle" design places heavy steel pads in staggered rows around each of 4 large diameter wheels. All compaction effort is directed downward with minimum displacement on entering and leaving the compacted area... gives a better finished surface.

Send now for Bulletin S-64854. See your nearest Buffalo-Springfield distributor for a demonstration on the job.

The Standard  of Comparison  
**BUFFALO-SPRINGFIELD  
ROLLER COMPANY**  
SPRINGFIELD, OHIO

### Film of machine at work

A new 21-minute sound-color film produced by the Gradall Division of The Warner & Swasey Co. explains the function of the Gradall and shows the machine at work on a wide variety of jobs. Entitled "Digging for Profits", the film shows on-the-job shots of pipe-laying, shaping finished grades, digging ditches, and shaping ditches which are to be lined with concrete.

The film is available to interested groups through Gradall distributors in the United States and Canada.

### Field engineers' catalog

Field equipment and supplies for field engineers are illustrated and described in a catalog from Frederick Post Co. Pictured are transits, levels, range poles, leveling rods, measuring tapes, field books, and allied equipment. Full specifications are included.

To obtain this catalog write to Frederick Post Co., 3666 N. Avondale Ave., Chicago 18, Ill., or use the Request Card at page 18. Circle No. 92.

## DUDGEON HYDRAULIC JACKS

**SALES  
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CAPACITY  
TO  
600 TONS

**FOR:**  
PILE  
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**DESIGNERS and  
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### Hydraulic Units For Special Applications

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LONG-LENGTH PLYWOOD used in combination with steel provides a "new look" in roof-truss design. Known as the PSI truss, this packaged component comes to the job site with lumber and plywood cut to detail, and steel and hardware fabricated to pattern. For details circle No. 157 on card at page 18, or write to Plywood Structures, Inc., 323 Pittcock Block, Portland, Ore.



REMODELING A FISH HATCHERY was the unusual assignment given this Huber-Warco Maintainer by the City of Dallas, Texas. The job consisted of deepening the ponds and rebuilding the levees in the 20-acre city-operated hatchery. Here the machine levels off a levee. For details circle No. 163 on card at page 18, or write to the Huber-Warco Co., Marion, Ohio.

### Study of carpenters union

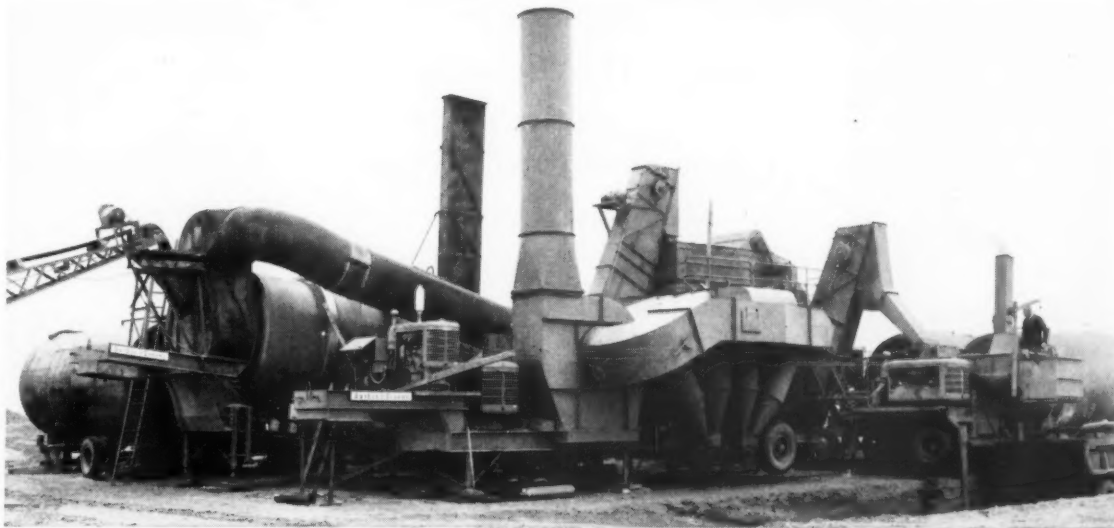
A new text in a series on industrial and labor relations has been published by Cornell University. Entitled "Empire in Wood", by Robert A. Christie, the text covers the history of the carpenters union from its beginning until the present time.

The struggles for survival after the introduction of power machinery, the personalities that formed the union, and the battle to stay free of Communist control are told in direct, vivid language.

Chronologically arranged, other topics discussed include radicalism, the problem of craft or industrial unionism, jurisdictional laissez faire and its challengers, and the taming of the New York City locals.

A 14-page complete index simplifies reference in the text.

Priced at \$4.50 for the paper-backed volume and \$5.50 for a cloth binding, the book is available through the New York State School of Industrial and Labor Relations, Cornell University, Ithaca, N. Y.



## How to lower the cost of asphalt paving

with Barber-Greene Continuous Plants . . . available in capacities from 20 to more than 200 tons per hour. Built for maximum portability, these plants produce all types of mixes at highest

capacity, and for lowest operating cost. Once the proportions are set, operation is automatic; the human element is eliminated and manpower requirements are reduced to a minimum.



with Barber-Greene Batchomatics . . . available in 2000, 4000 and 6000 pound sizes. Operating on inherently automatic principles, these plants save seconds at every point in the cycle. Instant change-over from automatic operation to manual production of mixes for the drive-in trade . . . instantly reset to preset repetitive cycle operation. New Dyna-Mix pugmill gives faster coating.



with the Barber-Greene Finisher. Having the widest choice of operating speeds, the Barber-Greene Finisher can lay every job at the maximum speed. It provides positive traction, superior maneuverability and unmatched ease of operation. Wide receiving-hopper simplifies truck discharge, eliminates spillage. No other machine paves as permanently, as speedily and as economically.

Write for literature on any plant in the cost-cutting line. Specify capacity.

56-25-AL

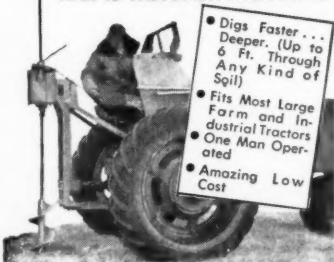
# Barber-Greene

AURORA, ILLINOIS, U.S.A.

CONVEYORS...LOADERS...DITCHERS...ASPALT PAVING EQUIPMENT

For more facts, use Reader-Reply Card opposite page 18 and circle No. 368

### NOW! A HEAVY-DUTY INDUSTRIAL DIGGER that is TRACTOR MOUNTED



DESIGNED FOR RUGGED DIGGING

- Telephone Poles
- Footings
- Heavy Posts

Prewitt's NEW INDUSTRIAL DIGGER allows one man to do the job it would ordinarily take a crew of men to do. P.T.O. driven, it utilizes full weight of rear of tractor to force auger into ground. Saves time and money!

FAMOUS PREWITT DIGGERS



HORIZONTAL



INDUSTRIAL



POST-HOLE

WRITE FOR FREE LITERATURE

Phone 40

J.R. PREWITT AND SONS SINCE 1929

Dept. 302, Pleasant Hill, Mo.

For more facts, circle No. 367

MAY, 1956



OUTPUT OF 100 TO 125 TONS PER HOUR is realized by the Harry Miller Excavating Co., Suffield, Ohio, with this Eagle portable crushing plant delivering aggregate for a highway job. The jaw crusher is 18 x 36. For details circle No. 159 on card at page 18, or write to the **Eagle Crusher Co.**, 124 N. Washington St., Galion, Ohio.



COMBINING THE WORK CAPACITY of a panel truck and the comfort of a passenger car this new Dodge Town Wagon truck carries men and tools to a job site. Eight and six-passenger models are available, and center and rear seats may be removed. For details circle No. 164 on card at page 18, or write to **Dodge Division**, Chrysler Corp., 7900 Jos. Campeau, Detroit 31, Mich..

The new and improved  
**HIGHWAY** heavy-duty  
"swing-base"

## EARTH-BORING MACHINE



DIGS THE HOLE

AND

SETS THE POLE

in any Soil!



**Faster, easier positioning . . . efficient, trouble-free digging at any angle**

The newly developed Highway "Swing-Base" Earth-Boring Machine allows the operator to rotate the base 180° — and then extend it up to 22". The boring machine will dig at any point within this arc and within the forward and aft traverse. Both movements are hydraulic, allowing finger-tip control.

The unit can be mounted on either a single rear axle truck or a tandem with optional hydraulic stabilizing supports. The "Swing-Base" Earth Borer will dig 9" to 36" holes in any soil, faster and easier than ever before.

New swing base and extension give remarkable versatility and extreme flexibility, allowing exact positioning regardless of location or angle of the truck.

**HIGHWAY UTILITY DIVISION  
HIGHWAY TRAILER COMPANY**

HEADQUARTERS: EDGERTON, WISCONSIN

Manufacturers of: Public Utility Bodies • Earth-Boring Machines • Pole and Cable Reel Trailers • Winches • Power Take-offs • Service Accessories • Commercial Trailers • TrailORIZED Tanks and Dry Bulk Haulers.

SALES AND SERVICE IN PRINCIPAL CITIES

For more facts, use Reader-Reply Card opposite page 18 and circle No. 369

### N. J. Pike extension to open next month

The first stretch of the Newark Bay-Hudson County extension of the New Jersey Turnpike—extending 3.6 miles from Newark Airport to Bayonne, was opened to traffic last month. By next month, the entire extension—running a length of 8.1 miles, will be completed, linking the turnpike with the Holland Tunnel Plaza.

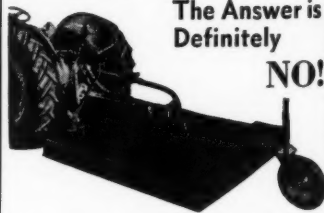
One of the biggest jobs in the entire project was the construction of a \$40 million high-level span across Newark Bay. A tied arch span, it provides 135 feet of vertical clearance at the channel. It has a center section 1,270 feet long. The west approach is 4,233 feet long and the east approach, 4,057 feet long.

The extension, believed to be the most expensive ever built, is costing a total of \$118 million. The cost of construction for a mile of the road comes to \$14,500,000. Interchanges will be located at Bayview Avenue, Jersey City, and at Avenue E, Bayonne.

### Are All Rotary Mowers of Equal Value?

The Answer is Definitely

**NO!**



**Check these important ways in which SUN-MASTR MOWERS EXCELL!**

1. The Most Powerful Gear Box.
2. Exclusive Design SLIP CLUTCH—in drive shaft where it belongs.
3. BLADES, highest quality Spring steel—double edge—gyral action.
4. Exclusive FLOATING ACTION features for clean mowing.
5. Special ROAD TRAVEL HITCH—Saves Tractor Hydraulic.
6. Manufactured by one of the pioneers in the Rotary Mower business.

**A MODEL FOR EVERY TRACTOR**

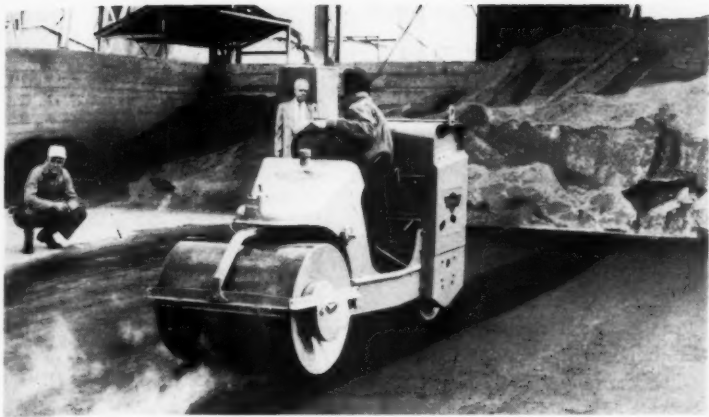
Send for FREE Catalog

**Sunflower Industries, Inc.**  
599-C So. Kansas Ave., Olathe, Kans.

For more facts, circle No. 370

CONTRACTORS AND ENGINEERS





GREATER COMPACTION than that provided by a 10-ton dead-weight machine is said to be obtained with the 1,700-pound Essick Model VR 32 R tandem vibrating roller, shown here completing a patching job on a municipal asphalt plant at Los Angeles. For details circle No. 167 on card at page 18, or write to the Essick Mfg. Co., 1950 Santa Fe Ave., Los Angeles 21, Calif.



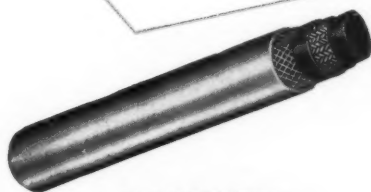
BALANCED SO THAT THE WEIGHT OF ONE MAN WILL EASILY TILT IT, the new Dorsey tandem tilt-to-load equipment trailer is available in models with capacities of 25,000 and 30,000 pounds. Rear lights are recessed for protection in the rear structural channel. For details circle No. 162 on card at page 18, or write to Dorsey Trailers, Elba, Ala.

### Thor to open new plant; moves branch office

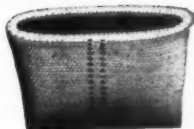
A new plant, designed to triple the production of its Speedway Mfg. Co. division, is under construction by the Thor Power Tool Co., Aurora, Ill. Located on a 15-acre industrial site in LaGrange Park, Ill., the new structure will house engineering, manufacturing, and office facilities for the production of portable electric Speed-Tools and fractional-horsepower electric motors. The building is slated for occupancy early in 1957.

New and larger quarters for the Denver, Colo., branch office of the company have already been placed in service by Thor. Serving Colorado, Utah, Wyoming, parts of New Mexico, Idaho, Nevada, Oregon, South Dakota, and Montana, the new office is located at 2704 W. Eighth Ave., Denver. The larger facilities and the addition of more service engineers to the staff will expedite service for distributors and tool users in the area, according to Thor officials.

## For long, trouble-free service . . . use **Quaker** hose



**AIR** Extra lightweight, highly flexible hose for heavy duty work. Resists weather damage and abrasion. Non-porous tube of oil resistant rubber compound. Rugged Neoprene cover. Ideal for almost any hose installation.



**FIRE** Resilient, flat-folding hose saves space and gives long service in interior fire protection. Highly flexible and resistant to cracking. Leak-proof tube bonded to strong single jacket cover. Recommended for institutions, offices, ships, etc.



**STEAM** Many times stronger than wrapped fabric hose for general steam-handling jobs. Also lighter, more flexible and kinkproof for easier handling. Steel wire and glass reinforcing insures extra safety. Resists high pressures up to 388° F.



**WELDING** No twisted, tangled lines. Two lines are securely bonded together to form a single, safe hose unit. Kink-free and resistant to welding gases. Stands up to lots of dragging across rough surfaces. Especially effective on portable welding dollies.



**WATER** For long wear and outstanding value, this easy-to-handle hose has what you need. Reinforced with multiple plies of high tensile yarn, it takes higher than usual working pressures. Cover stands up to weather extremes without cracking or peeling.

Save time and money. Call your Quaker-Quaker Pioneer distributor first, when you need hose or other industrial rubber products. You'll find him prompt, dependable.



### The answer to successful use of **HIGH STRENGTH STRUCTURAL BOLTS**

This impact wrench calibrator makes it easy to accurately tighten every bolt to specified tension. Permits on the job determination of wrench performance. Simple adjustments are then readily made to make the wrench stall when proper tension is reached.

• ACCURATE • PORTABLE • RUGGED •  
• PROMPT DELIVERY •

Write for bulletin 102

**SKIDMORE-WILHELM**  
Manufacturing Company  
442 Green Rd., Cleveland 21, Ohio

**H K P**  
DIVISIONS OF  
H. K. PORTER COMPANY, INC.

**H. K. PORTER COMPANY, INC.**

**QUAKER RUBBER DIVISION**  
Philadelphia 24, Pa.

**QUAKER PIONEER RUBBER DIVISION**  
San Francisco 7, California

For more facts, use Reader-Reply Card opposite page 18 and circle No. 372

For more facts, circle No. 371  
MAY, 1956

## Highway officials elect

The Mississippi Valley Conference of State Highway Officials has elected John Butters, chief engineer of the Iowa Highway Department, president of the organization. At the same time, George M. Foster, chief deputy commissioner of the Michigan State Highway Department, was elected secretary-treasurer.

## Fluorescent lighting

■ LUXaire, a fluorescent lighting unit for bridges, buildings, and tunnels is detailed in a catalog from the manufacturer, Pfaff & Kendall. The catalog states that the system produces from three to five times the amount of light per watt over incandescent lamps, with true color retention and long lamp life. Actual installations are

shown, as well as various models, and accessories. Complete specifications accompany each model.

To obtain this catalog write to Pfaff & Kendall, 84 Foundry St., Newark 5, N. J., or use the Request Card at page 18. Circle No. 104.

## Gardner-Denver appoints two new sales managers

The Gardner-Denver Co., Quincy, Ill., has appointed William B. Knoderer sales manager of the industrial division and Niel Martin Fishback sales manager of the firm's mining and contracting division.

Knoderer, an electrical engineer, was formerly associated with the company's Keller Tool Division. With Gardner-Denver since 1948, Fishback served as district manager in El Paso, Texas, until his present appointment.

## Air-conditioned building for Capital Records

To the Editor:

CONTRACTORS AND ENGINEERS

Your article on the Capitol Records building was interesting, but I think that you might have qualified the line: "And although it is hard to believe, the structure is the first fully air-conditioned office building in Hollywood. . . ."

I've no stake in Hollywood or in air conditioning, but I wonder if the reason might not be the fact that office construction in Hollywood proper has been at a minimum for some years. The same wouldn't hold true in Wilshire, where a new office building seems to pop up every time you catch a bus. Many of them are air-conditioned.

Bill Graydon  
2107 Mayview Drive  
Los Angeles 27, Calif.

## New handbook outlines electrical estimating

The 1956 edition of the "Blue Book of Electrical Estimating", by George L. Sherlock presents tables of information on such topics as anchors, armored brush cable, armored lead cable, cable non-metallic sheathed, underground non-metallic cable, cable service metallic, and carpentry. Lighting equations, motor characteristics, switches, expansion fittings, and junction boxes are also covered.

Priced at \$7.75, the book is available from the Estimating Handbooks Associates, 1801 Pleasant St., De Kalb, Ill.

A list of approaching conventions appears on page 35.



## Jaeger pumps know how to handle water

Two independent, simultaneous priming actions . . . fast and doubly sure. • Oversize shells and impellers, engines of largest horsepower applicable. • The only positively lubricated shaft seal with ready inspection port. • Prime without racing, pump at slower speeds, pump more thousands of hours. Performance guaranteed. Sizes 1½" to 10". See your Jaeger dealer or send for Catalog P4.



THE JAEGER MACHINE COMPANY • 701 Dublin Ave., Columbus 16, Ohio

COMPRESSORS • MIXERS • TRUCK MIXERS • SPREADERS • FINISHERS • LOADERS

For more facts, use Reader-Reply Card opposite page 18 and circle No. 373

## 3 Simple Reasons Why



## TRANSCRETES®

## Put Bigger Profits in Your Pocket!

Take features like TRANSCRETE'S time-tested outswinging hopper and floating drive — add to them NEW SHORTER OVERALL LENGTH — and it's no wonder TRANSCRETE beats 'em all a country mile for pouring more and better concrete — easier, faster — and at less cost!

There's a size TRANSCRETE (4 models, from 3½ to 7 yard mixing capacities) to do any job in the books.

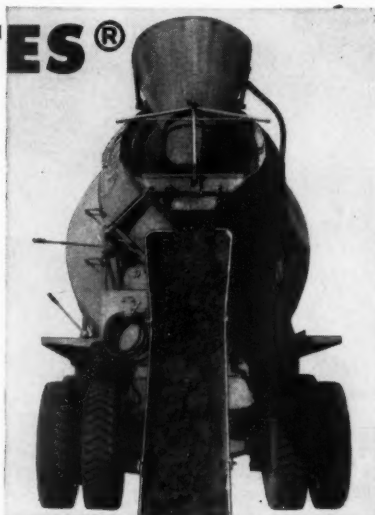
New Model 700 hauls up to 8 plus yard loads — mixes any 7-yard batch. Write CONSTRUCTION MACHINERY CO., Waterloo, Iowa.



## ① FASTER CHARGING



## ② MORE THORO MIXING



## ③ QUICKER DISCHARGE

Write for NEW, FREE, Just-Off-The-Press  
**1956 TRANSCRETE Catalog**  
Construction Machinery Co., Waterloo, Iowa

For more facts, use Reader-Reply Card opposite page 18 and circle No. 374

## New laboratory manual for soil-cement testing

A new book, "Soil-Cement Laboratory Handbook," features modifications in practice that have reduced testing time by two-thirds. An aid to engineers testing soil cement, the book discusses the short-cut procedure for sandy soils, a simplification of wet-dry and freeze-thaw tests, and rapid methods of testing soils for small projects.

Copies are available on request from Portland Cement Association, 33 W. Grand Ave., Chicago 10, Ill.

## Flexible Steel appoints new sales representative

The Flexible Steel Lacing Co., Chicago, Ill., has assigned Al Gladding to the post of sales representative in the northeastern states. He succeeds Les Coleman, who has been transferred to the firm's Chicago office.

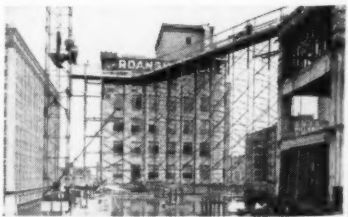
## HOW TO MAKE ONE HOISTING TOWER DO THE WORK OF TWO



**MATERIAL ON THE MOVE.** To move materials from the twelve-story hoisting tower to a penthouse being built 100 feet away, a Minneapolis contractor used WACO scaffolding to build a connecting catwalk.



**KEEPING PACE WITH PROGRESS.** As floors were added to the penthouse, another tier of scaffolding was erected so concrete and other material could be unloaded directly at the working level.



**FINISH WITH A FLOURISH.** After the third and final story was reached, only 98 WACO scaffold frames had been used, and the contractor had eliminated an auxiliary three-story hoist and the extra manpower to operate it.

WACO's standard-size frames, pivoted cross-braces, built-in ladders and floating coupling pins make WACO scaffolding the first choice of leading contractors. What's more, WACO's exclusive Speedlock substantially cuts erection and take-down time by allowing quick tying of frames and cross-braces. Let experienced WACO engineers or distributors show you how to cut scaffolding costs, and meet tight construction schedules. For the name of your nearest WACO distributor, consult the yellow pages of your telephone directory, or write to:

**WACO MANUFACTURING COMPANY**  
3569 Wooddale Avenue South  
Minneapolis 16, Minnesota

LICENSEES:

Waco May Co. Armson Iron Works  
Los Angeles Windsor, Canada

For more facts, circle No. 375

CONTRACTORS AND ENGINEERS





### New washing, screening plant now available

■ A new, portable sand and gravel washing and screening plant is now being offered by Pioneer Engineering Works, Inc. The new plant—designated the 512-VW—is being offered with only the basic unit as standard equipment. Other units intended to adapt the basic plant to local conditions are optional.

The 512-VW turns out two sizes and oversize of gravel and one size of washed sand simultaneously, and has demonstrated a production capacity of up to 340 tons per hour, according to the manufacturer.

The standard basic unit consists of a 5×12-foot three-deck gradation screen, a 30-inch×25-foot double-screw fines material dehydrator, a 30-inch×35-foot on-the-plant feeder conveyor, and an 18-inch×25-foot and a 36-inch×25-foot side-delivery conveyor. The side-delivery conveyors may be attached on one side or both sides of the plant.

Optional units including a mechanical (reciprocating-plate) type feeder, used when not feeding the plant directly from the delivery conveyor of a crushing plant; a 30-inch×40-foot ground feeder conveyor, mounted on cradle truck, used with the mechanical feeder; a coarse-material dehydrator unit having a 24-inch×15-foot single-screw dehydrator and a 3×6-foot single-deck buzzer screen; an 18-inch×70-foot conveyor mounted on hydraulic cradle truck, for delivery of washed gravel from the coarse material dehydrator; and a 24-inch×70-foot conveyor, also mounted on portable cradle truck, for delivery of washed sand from the fines material dehydrator on the main unit.

For further information write to Pioneer Engineering Works, Inc., 1515 Central Ave., Minneapolis 13, Minn., or use the Request Card at page 18. Circle No. 40.

### Driver instruction shown in new film

A 16-mm driver-instruction film, showing the operation of semi-automatic RoadRanger transmissions under all driving conditions, has been released by the transmission division of Fuller Mfg. Co., Kalamazoo, Mich.

Filmed in color, the 25-minute sound movie describes the operating principles of the Models R-96, R-960, R-46, and R-1150 RoadRangers. Copies of the film may be secured, without charge, from Fuller truck dealers and distributors.

The Pioneer 512-VW portable sand and gravel washing and screening plant.

### Portable steel hut

■ A heavy-gage formed steel frame and corrugated galvanized siding and roofing sheets comprise the Handy-Hut portable building, according to a mailing piece from the manufacturer, United Steel Fabricators, Inc. The hut may be used for storing materials and machinery, or as a contractor's job office. The clip-and-wedge erection method is pictured. Side panels, ends, and special features are diagrammed.

To obtain this mailing piece write to United Steel Fabricators, Inc.,

Gasche St., Wooster, Ohio, or use the Request Card at page 18. Circle No. 96.

### Gar Wood names Hager director of manufacturing

Gar Wood Industries, Inc., Wayne, Mich., has appointed Joseph R. Hager, Jr., director of manufacturing for the firm. He will direct activities at Gar Wood plants in Wayne, Mich.; Findlay, Ohio; Mattoon, Ill.; and Richmond, Calif. A. S. Wurfel will serve as assistant director of manufacturing.

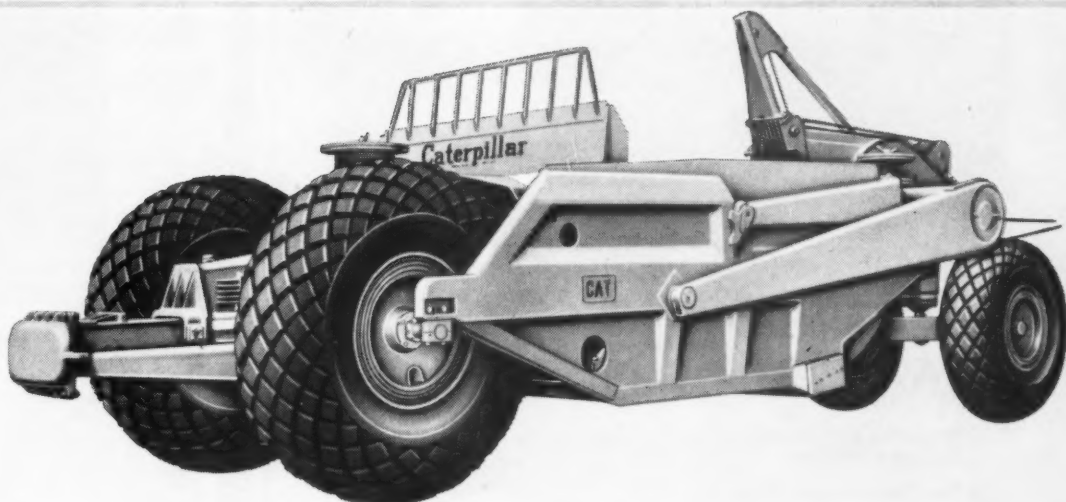
## ANNOUNCING CATERPILLAR'S

# NEW NO. 463

# LOWBOWL SCRAPER

(four wheel, crawler drawn)

## 25 cu. yd. heaped 18 cu. yd. struck



### 11 Reasons Why the No. 463 Delivers Bigger Loads at Lower Costs per Yard!

1. **Lowbowl design**, a new concept developed by and exclusive with Caterpillar, loads more material with less resistance clear to the end of the loading cycle.
2. **Large capacity** without using sideboards—25 cu. yd. heaped.
3. **Easy, fast loading** of full, heaping loads.
4. **Large apron opening** for speedy, easy ejection of sticky material.
5. **Positive 'dozer-type' ejection** that sweeps the bowl clean and allows fast, controlled dumping.
6. **Flat bottom** for smooth, level cuts—excellent on any finishing job.
7. **Good digging action** with stinger bit.
8. **Wheels track within cutting edge** for level cuts.
9. **Adjustable rear axle height** that allows bowl leveling with unevenly worn rear tires.
10. **Rugged construction** with high-strength steels for long life, low maintenance costs.
11. **New tubeless tires** for greatly reduced tire maintenance costs.



For bigger production at lower cost on shorter hauls, here's a new CAT\* earthmover—the No. 463, featuring Lowbowl design. From stinger bit to ejector, this new scraper is engineered to load, haul and dump with maximum efficiency. You can count on it to deliver top performance with a minimum of down time on your toughest job. For complete information about the No. 463, see your Caterpillar Dealer!

Caterpillar Tractor Co., Peoria, Illinois, U.S.A.

# CATERPILLAR\*

\*Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

**NEW NO. 463 SCRAPER—  
LATEST EXAMPLE OF CATERPILLAR  
LEADERSHIP IN ACTION**

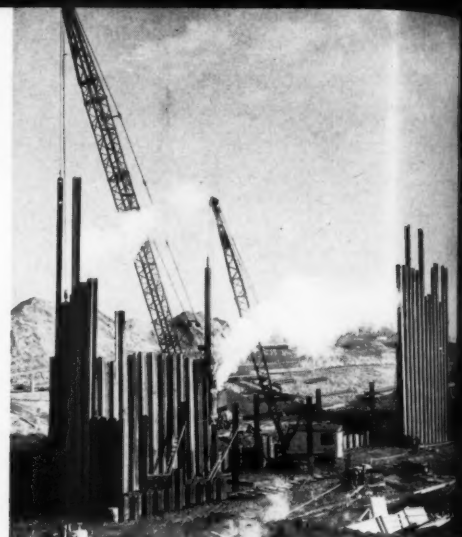
For more facts, use Reader-Reply Card opposite page 18 and circle No. 376



**EXPENSIVE STONE**—including Swedish black granite valued at \$400 per slab—is being placed at the Auditorium Plaza garage, Kansas City, Mo., by a Pitman Model 80 crane mounted on a White truck.



**STRUCTURAL STEEL** for the new Rock County Court house in Janesville, Wis., is set by a Manitowac 2000 crane. Wisconsin Bridge & Iron Co., Milwaukee, subbed the work.



**STEEL PILING** for a cooling water pumping station is driven by a big Link-Belt Speeder and a smaller crane for the Tide Water Associated Oil Co.'s refinery near Wilmington, Del.

## The Fast, Easy Way To Drill Concrete



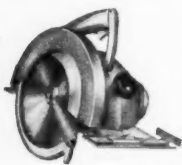
**SYNTRON**

### ELECTRIC HAMMER DRILL

- Exclusive Automatic Rotating Drill Bit
- Ten Times Faster Than Hand Methods for Drilling
- Continuous Operation —Practically No Maintenance

The only Electric Hammer Drill available with automatic, self-rotating drill bit. Operates at high speed for fast production drilling. Electromagnetic drive—only one moving internal part. Requires little or no service even after constant usage on toughest drilling jobs. Electric Hammer models for chipping, cutting, pointing, scaling, etc., also available.

### Other SYNTRON POWER TOOLS that reduce Job Time and Costs



#### Gasoline Hammer ► PAVING BREAKERS & ROCK DRILLS

2000 blows per minute for digging, tamping, busting, or drilling in paving, clay, rock, shale, etc. Bit rotates automatically for drilling.



#### ► CONCRETE VIBRATORS

Gasoline or electromagnetic models for uniform compacting and settling on large mass or form concrete projects.



#### Belt Driven ELECTRIC SAWS ►

Deliver full cutting power to blade—no bucking or jerking. For production cutting of wood, concrete block, plaster board, etc., 8" and 10" blades—2-13/16" and 3-1/4" cuts.

Write Today for Complete Tool Catalog—FREE

**SYNTRON COMPANY**

227 Lexington Ave.

Homer City, Pa.

For more facts, use Reader-Reply Card opposite page 18 and circle No. 377

## THE SURVEYOR'S NOTEBOOK

Reporting on Unusual Surveying Problems and Their Solutions  
Notekeeper: W. & L. E. Gurley, Established 1845

### A Few "Tricks of the Trade"

Unusual Field Tips Suggested by Readers of "The Surveyor's Notebook"

A Louisiana engineer has come up with an interesting method of locating shot points during seismograph surveys. The shot location was practically inaccessible in the bayous.



Gurley Telescopic Solar Transit

However, general direction was known from two points on a base. When the shot was sent off, considerable dirt and smoke were blown into the air; and two transits intersected the shot to give location close enough for practical purposes. (Speaking of inaccessible sights, the Gurley Telescopic Solar Transit quickly gets around obstructions with sun shots. Procedure of carrying a line forward with a Gurley Solar eliminates one man from a party. The time and labor saved "pay off" the instrument in a few seasons. Write for information on Model 112-RT.)

For night work, an automobile spotlight can aid the surveyor greatly. One engineer directs his vertically...uses suspended plumb lines at right angles to each other to plumb the beam. The beam is used for signaling when the transit party is to take the sight...sight is taken on the vertical beam when it appears in the sky.

Some engineers ask for horizontal stadia lines on their transit reticles. This permits use of a horizontal rod—or even a common tape—for measuring distance. Using a right angle prism or Locke hand level with a right angle, a line is laid off perpendicular to the line of sight; and two targets such as pins or range poles are set on this line so that they are exactly matched to horizontal stadia. Distance between the two can then be measured, giving a means of determining stadia distance.

Can you use these field aids? Gurley can supply 50-pound test yellow nylon plumb bob cord, to add to the visibility of your string in poor lighting. Also a cord adjuster, which helps you make quick changes in line length in the field. Send 25 cents in stamps or coin for a set of cord and adjuster with a drawing showing how to use them.



NEW EDITION OF "SURVEYOR'S NOTEBOOK"; We have collected the most helpful, most discussed pages from Series One and Two of "The Surveyor's Notebook" in one 20-page book. These valuable field tips will help you use your own instruments with greater success. Write for your free copy.

**W. & L. E. GURLEY**

Fulton & Station Streets, Troy, N. Y.

**GURLEY** Surveying and Scientific Instruments

For more facts, use Reader-Reply Card opposite page 18 and circle No. 378





**EARTHWORK IS THE FIRST** big step in changing the character of the state penitentiary grounds in Nashville, Tenn., where the new glass division of Ford Motor Co. will be built. Euclid 15-yard rear-dump trucks and a Bucyrus-Erie 22-B dragshovel are being used by McDowell & McDowell, Nashville, for grading.



**TOUGH CORAL ROCK**—almost two million cubic yards of it—is ripped by a Caterpillar D8 tractor equipped with a rock plow during site preparation for the 1,400-acre Miami Heights Housing project. D. M. W. Contracting Co., Inc., Perrine, Fla., is handling this work for the 5,000-home development.

### Wrigley Field to operate passenger conveyor units

Eight Speedwalk passenger-conveyor units, manufactured by the Stephens-Adamson Co., Aurora, Ill., have been installed in Wrigley Field, Chicago, Ill. Operating in two sections of four units each, the Speedwalks run from the ground level to the grandstand and from the grandstand to the upper level.

The conveyors will cover a total length of 400 feet on the eight slope

runs with passengers moving uphill at a total vertical distance of 60 feet. The belts are reversible so that they can carry passengers either up or down.

Open-type handrails on the installation will give clear visibility to ushers in charge of the units. Four centrally located control boxes will operate the conveyors in four groups of two units each.

### New text treats advances in foundation engineering

The second edition of "Substructure Analysis and Design," by Paul Andersen, incorporates developments in the field of foundation engineering since the publication of the first edition eight years ago. Emphasis is placed on the methods and procedures of determining stresses developed in various parts of a substructure, rather than on the problem of soil.

Divided into thirteen chapters, the text discusses earth pressures, sheet

piling, soil bearing power, footings, piles, cofferdams, piers, and abutments. Problems at the end of each chapter form a practical application of the material taught.

Well illustrated with charts, graphs, photographs, and formulas, the book is available direct from the publisher, The Ronald Press Co., 15 E. 26th St., New York 10, N. Y. The cost is \$7 a copy. Supplementary data is included in the 24-page appendix.

**STURDILITE**

**Heavy-Duty FLOOD LAMPS**

For Better Light • Longer Service • Lower Cost

Especially Designed for Efficient Service on

Shovels • Excavators • Drag-Lines • Roadbuilding Equipment • Locomotive Cranes • Tractors . . .

Metal Spinning Division  
**PHOENIX PRODUCTS CO.**  
4727 N. 27TH ST. • MILWAUKEE 16, WIS.

Available in 6-8, 12-16, 24-28, and 110-120 voltages.

Rubber Mounted Base Standard Model

Write for Illustrated Bulletin.

For more facts, use Reader-Reply Card opposite page 18 and circle No. 379

**NEW 1956 NEW LEADER MODEL AS BITUMINOUS CONCRETE and AGGREGATE Spreader**

**FAST, ECONOMICAL**

PAVING FOR • Roads • Highways • Streets • Playgrounds • Airports • Driveways • Parking Lots

**Handles Large or Small Paving Jobs with Equal Efficiency!**

SEE FOR YOURSELF . . . COMPARE BEFORE YOU BUY! Insist on a spreader with ALL the features of the new 1956 Model AS Bituminous Concrete & Aggregate Spreader.

Enables contractors to make a good profit on jobs they previously turned down because larger machines or hand labor made the job unprofitable. Here is the only unit offering the exclusive economy features that will enable you to come out with a higher net profit on competitive bid jobs.

The new Model AS SAVES YOU MONEY

**ON LABOR**—does the job faster with less manpower.

**ON MATERIAL**—lays an accurate even mat over uneven base course.

**ON TIME**—eliminates expensive equipment and time in preparing base course.

*Spreads*

Gentlemen . . .

Please send Bulletin AS-641 on NEW LEADER Model AS Spreader to . . .

NAME \_\_\_\_\_  
TITLE \_\_\_\_\_  
ADDRESS \_\_\_\_\_  
CITY \_\_\_\_\_ STATE \_\_\_\_\_

**HIGHWAY EQUIPMENT CO., Inc.**

616 D Ave., N.W., Cedar Rapids, Iowa

MANUFACTURERS OF THE WORLD'S MOST COMPLETE LINE OF SPREADERS AND BULK MATERIAL DELIVERY EQUIPMENT

For more facts, use coupon, or Reader-Reply Card opposite page 18 and circle No. 380



A BIG RIG for a big job, this rotary blast drill brings 22½ tons of force to bear on a bit as it drills some hard formations at the St. Lawrence Seaway site. The Bucyrus-Erie rig has over 200 horsepower in its Westinghouse motors and generators.



EXCAVATION GETS UNDER WAY on the new San Jose, Calif., sewage plant. This Lorain 22½-ton Moto-Crane is being used by Walsh Construction Co., Milpitas, Calif., and New York, N. Y., for excavating, setting steel, erection of concrete forms, and concrete placement on this job.

## INTERNATIONAL sells more 6-wheel trucks than the next two makes combined!



And this kind of sales leadership has been going on every year for the past 21 years! One big reason: Actual cost records of the professional fleet operators—the men who *know* truck costs—prove these trucks cost less to own. Let your INTERNATIONAL Branch or Dealer show you in black and white, today. INTERNATIONAL HARVESTER COMPANY, Chicago.

**INTERNATIONAL<sup>®</sup>**  
**TRUCKS**

FIRST with men who know truck costs!

For more facts, use Reader-Reply Card opposite page 18 and circle No. 381

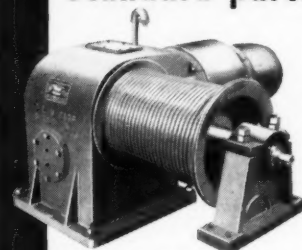
### Reference book de

The third in a series of comprehensive books on earthmoving by Herbert L. Nichols, Jr., provides complete information about the planning and execution of excavating and grading projects. "Modern Techniques of Excavation", a shortened and revised edition of "Moving the Earth", the first book of the series, also contains a chapter on maintenance and a criticism of modern equipment.

The text closely parallels the earlier book's section entitled "The Work" in describing the problems that arise, and the planning, supervisory, and operational techniques used in solving them. However, details of construction and the basic operation of equipment have not been included in order that the abridgement might be more useful to works-planning and field men in engineering and contracting firms.

The twelve chapters include de-

### BUILT TO YOUR needs from standard parts



15-HP SPECIAL  
PURPOSE HOIST  
single fixed drum, worm gear drive

Meet your hoisting needs precisely at lowest possible cost. Call on our long experience in modifying and re-combining standard parts to meet specialized hoisting requirements.

Write for bulletins and catalogs

**SUPERIOR-LIDGERWOOD-  
MUNDY CORPORATION**

Main Office and Works:  
SUPERIOR, WISCONSIN, U.S.A.  
New York Office, 7 Day St., N.Y. 7, N.Y.  
For more facts, circle No. 382

CONTRACTORS AND ENGINEERS





SMALL EXCAVATION JOBS for the \$5 million Goodyear distribution center near Cleveland, Ohio, are handled by this Hyster backhoe attachment mounted on a Caterpillar D8. Here the attachment uses its 1/2-yard bucket to dig utility ditches at the site of the project.



ROCKS PUSHED OUT of the bottom of a stream near Bartlett, N. H., by an International TD-24 with dozer, will be crushed and used as base material for a 2.75-mile stretch of Route 302 that is being widened and relocated. C. R. West Contracting, Erroll, N. H., holds the \$323,181 contract.

## Modern excavation methods

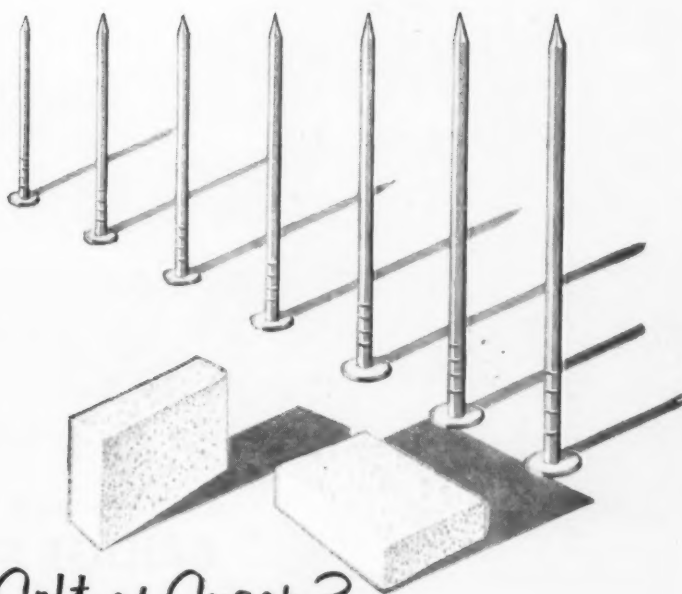
tailed discussions of land clearing, levels and locations, soil and mud, stuck machinery, cellars, ditching and dewatering, ponds, landscaping, roads, rock blasting and tunneling, digging underground, and pit operation. A chapter headed "Making and Losing Money" studies estimating, contracts, accidents, insurance, and machinery.

In a criticism of modern machinery, Mr. Nichols first praises the work of reputable equipment manufacturers, but goes on to say that just as black sheep are as common in good families as in bad, so are "lemons" just as frequent in the equipment of the best manufacturers.

The difficulty with new equipment might arise from either of two sources, poor design or poor workmanship and materials, or a combination of both. A gap between drafting-room theory and actual field practice,

(Continued on next page)

# HARD AS NAILS



or Soft as Sugar?

**Cedarapids can crush it!**

Granite, traprock, slag, chalk... there's a Cedarapids crusher built to handle it profitably!

Whatever operating conditions face you... whatever your specification requirements or tonnage demands... Cedarapids complete line of crushers, screens, feeders, conveyors... or portable plants... meet your needs for big-volume production at low cost.

Write us about your problem. Construction-wise Cedarapids engineers can help you solve it.

**IOWA MANUFACTURING COMPANY**  
Cedar Rapids, Iowa, U. S. A.

Manufacturers of the most complete line of aggregate producing and bituminous mixing equipment.

For more facts, use Reader-Reply Card opposite page 18 and circle No. 384

## INDIAN DRINKING WATER & SUPPLY TANK NO. 75G



Replaces unsanitary bucket and dipper. Portable. Push button faucet. Takes cold, clean water to workers right on the job. 5-gallon steel tank is carved to fit the back. Sturdy construction. Highly popular.

### SMITH

Compressed Air  
No. 22GO BANNER  
SPRAYER

Capacity 4 Gals.

For spraying Silicon water repellents for masonry work and many other spraying purposes. Finest compressed air sprayer built. Send for catalog.

Discounts in Quantity Lots

**D. B. SMITH & COMPANY**

"Choice for Quality the World Over"  
470 Main St., Utica 2, New York

For more facts, circle No. 383

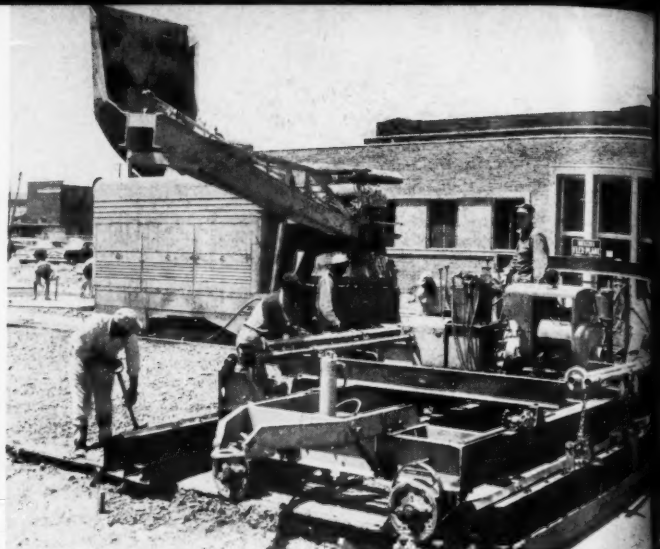
MAY, 1956

YOUR STRAIGHT LINE TO PROFIT





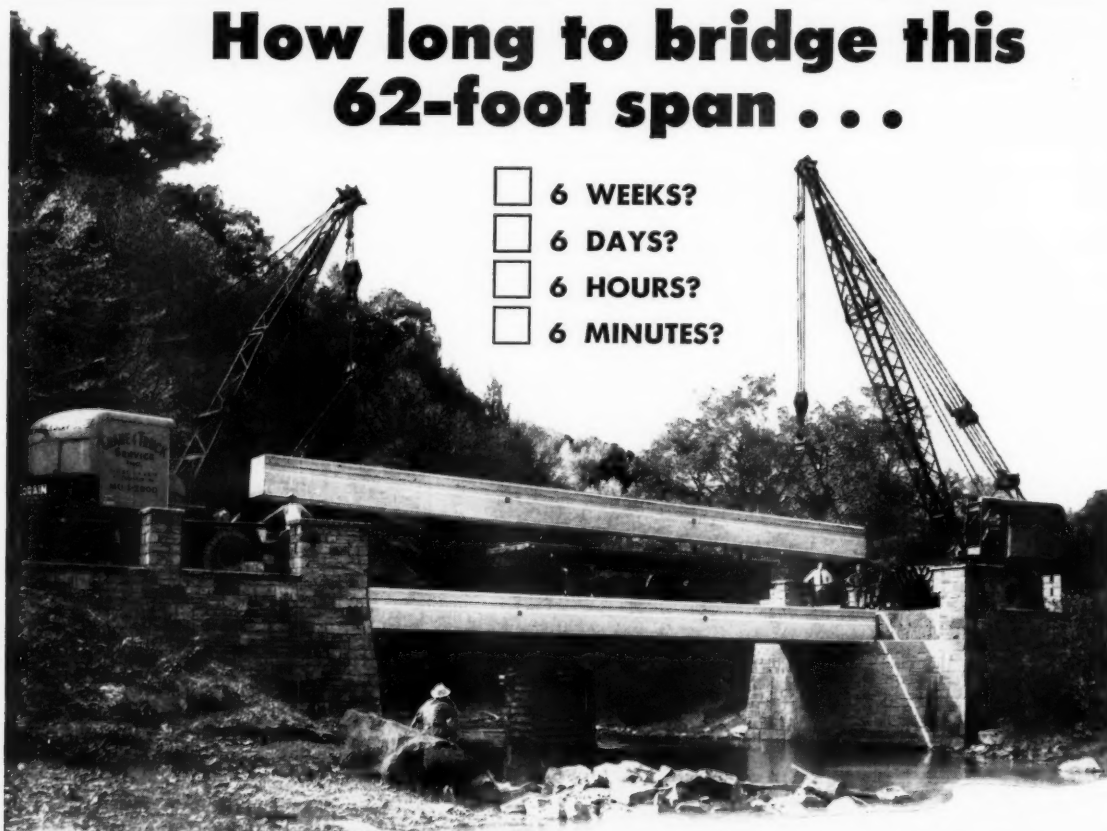
ROCK TO BE PROCESSED for use as base course material on U. S. 41 near Smyrna, Tenn., is loaded out of the quarry by a Koehring 605 shovel with a 2-yard bucket. J. B. Michaels & Co., Inc., Memphis, Tenn., is using Euclid end-dumps to haul rock to the crusher.



RIGHT THROUGH THE CENTER of Evansville, Ind., goes the Rex 34-E dual-drum paver and Heltzel Flex-Plane finisher working on the new Evansville Expressway. Paving is being done by Fiegel & Ryan, a joint-venture firm of Evansville.

## How long to bridge this 62-foot span . . .

- ☐ 6 WEEKS?
- ☐ 6 DAYS?
- ☐ 6 HOURS?
- ☐ 6 MINUTES?



**AMDEK**

### Prestressed Pretensioned Concrete BRIDGE SUPERSTRUCTURES

**6 HOURS!** That's the remarkably short time it took a few workmen to span Laurelhill Creek near Somerset, Pennsylvania with the longest prestressed bridge in the state. Seven "factory-built" AMDEK sections were swung by cranes into position on offsets built into the old bridge abutments. After a few finishing touches, the bridge was ready for use!

Prestressing, pretensioning and vacuum processing—plus the use of special voids—results in a stronger, lighter bridge member that can be handled by contractors like steel beams—in any weather. You save time, cut costs—build beautiful bridges that give perfect, maintenance-free service for years! Find out more about AMDEK Bridges . . . write for literature and all details.

Qualified manufacturers will be accepted as licensees to produce AMDEK. Write for details



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Concrete Conduit Company	Lamar Pipe and Tile Company	Universal Concrete Pipe Co.
Tellyer Concrete Pipe Co.	American-Marietta Company of Pennsylvania	

For more facts, use Reader-Reply Card opposite page 18 and circle No. 385

(Continued from preceding page)  
a cause of many defects, could be remedied by allowing contractors to make design suggestions to manufacturers.

Common failures in equipment are listed along with recommended remedial practices. The fact that a good distributor frequently can correct minor defects does not, according to the author, condone the manufacturer for poor material or workmanship, or make up to the contractor for downtime and disrupted schedules. That errors are inevitable can be understood and so long as they are made good with reasonable promptness, they should not be held against the manufacturer. The fact still remains, however, that millions of dollars worth of equipment limps along from year to year because of some minor intrinsic flaw in construction.

Each chapter of the book is well illustrated with photographs, charts, and diagrams—more than a thousand in all. An appendix contains charts

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Ten minutes faster than other irons.

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CONTRACTORS AND ENGINEERS



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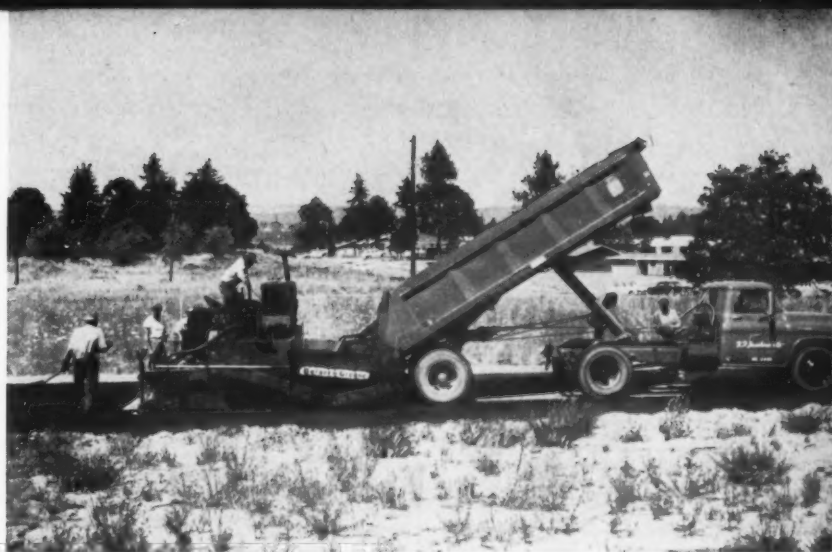
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ERS



TRENCHING IN CLAY and hardpan is one of the jobs assigned to this  $\frac{1}{2}$ -yard Bucyrus-Erie 15-B dragshovel during construction of the new city high school in Bloomfield, Conn. Stamm Brothers, Newington, Conn., is using the rig to prepare the way for the building's sewage system.



TWICE THE PAYLOAD of a dump truck is fed by a Hobbs Schonrock cable-dump trailer to the Barber-Greene finisher working on the outskirts of Portland, Oreg. Four trailers, each hauling more than 14 tons of hot-mix, are helping Karl F. Jacobsen Co., Portland, average 6,500 feet of 10-foot lane daily.

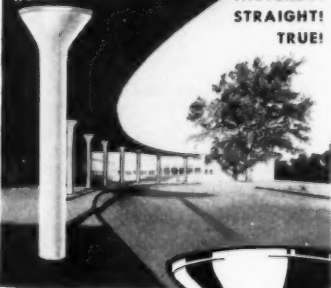
and diagrams of production costs, reference formulas, weights and measures, and other helpful information, and a 27-page glossary defines technical terms used throughout the 608-page work.

Priced at \$9, "Modern Techniques of Excavation" is available from the publisher, North Castle Books, 212 Bedford Road, Greenwich, Conn.

#### New stamp commemorates construction of road

Though stamp collectors may prove otherwise, what is believed to be the first stamp ever to feature a scraper has been issued by the French Post and Telecommunication Administration. Featuring an earthmover like the LeTourneau-Westinghouse Model D Tournapull, the stamp issue commemorates the completion of the new road linking Abengourou with Abidjan in the Ivory Coast Territory of French West Africa. Done in a purple and red color combination, it sells for about 17½ cents.

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For more facts, circle No. 387

MAY, 1956

## Let **SEALZ** help you save on all paving costs

Naugatuck Chemical's specially developed SEALZ rubber compounds for roads and runways can help give you pavements that *last longer, require less maintenance, and are easy and economical to apply.*

**Surfa-SEALZ**—a synthetic rubber additive for bituminous concrete *now in handy pellet form*—gives a strong, elastic bond of asphalt to aggregate that greatly reduces flushing—keeps pavement tough and flexible through all kinds of weather.

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**Joint-SEALZ**—a hot-poured *joint sealer* for concrete pavements—forms a tight, lasting bond that won't extrude in the hottest weather, won't crack, or pull away in the coldest.

**Aero-SEALZ**—a jet-fuel-resistant joint sealer for concrete *airport surfacing*—resists damage from fuel spillage, petroleum distillates, and engine cleaning compounds—gives longer trouble-free *ramp and runway* life.

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Let science help solve your surfacing and sealing problems. Write for more information on SEALZ® compounds today.



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For more facts, use Reader-Reply Card opposite page 18 and circle No. 388





Instead of push-loading scrapers, Hendrickson uses a Bucyrus-Erie 71-B shovel, powered by a GM diesel, to load a Caterpillar 32-yard scraper. An M-R-S 190 tractor pulls the earthmover.



The second shovel loading the scraper spread is this P&H with 3-yard bucket, which here fills a Caterpillar DW21 with the sandy material. All required fill material is obtained from roadway excavation.

## For Dependable Protection

On Construction Industry's  
Hydraulic Equipment



SUMP TYPE  
(cutaway)

### Hydraulic Oils MUST BE CLEAN

to Protect Equipment—  
Increase Production—  
Reduce Maintenance

CONSTRUCTION ENGINEERS AND MAINTENANCE MEN, whose job it is to keep construction equipment operating at peak efficiency, are specifying Marvel Synclinal Filters to be installed on all new equipment and standardizing with Marvel Synclinal Filters on existing equipment.

### It's The ACTIVE Filtering Area That Counts!

The Synclinal design of Marvel Filters provides that all-important balance between maximum ACTIVE filtering area and sufficient storage capacity for filtered out particles. Thus, longer periods of productive operation are attained before filter cleaning is necessary. Marvel Synclinal Filters are easy to clean because both the sump and line type may be disassembled, thoroughly cleaned and reassembled in a matter of minutes. Line type operates in any position and may be serviced without disturbing pipe connections.

### A SIZE FOR EVERY NEED

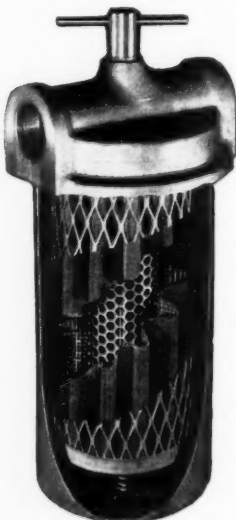
Available for sump or line installation in capacities from 5 to 100 G.P.M. Greater capacities may be attained by multiple installation (as described in catalog). Choice of mesh sizes range from coarse 30 to fine 200.

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As in the past, Marvel continues to offer IMMEDIATE DELIVERY.

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Over 650  
Original  
Equipment  
Manufacturers  
Install Marvel  
Synclinal Filters  
as Standard  
Equipment.



LINE TYPE  
(cutaway)

### FILTERS FOR FIRE-RESISTANT HYDRAULIC FLUIDS

Marvel's most recent development is a filter for the efficient filtration of all types of fire-resistant hydraulic fluids.

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Both sump and line type filters have been adapted for use in all water filtering applications. No changes have been made in the basic, balanced synclinal design.

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CE-5

For more facts, use coupon

## Large spread spurs highway

*Earthwork involves handling of more than  
a million yards of sand; paving train avoids snarls  
by starting work at midpoint of the job*

Making maximum use of his equipment—and even using shovels to load scrapers—Hendrickson Bros., Inc., Valley Stream, N. Y., moved as much as 5,800 cubic yards of earth in an 8-hour work day on the \$8 million dual-road project that will link two major east-west arteries on Long Island, N. Y., by this October.

This 8-mile extension of the Meadowbrook State Parkway, which now connects the Southern State Parkway and Jones Beach, called for 1,370,000 cubic yards of earth to be moved before a pavement could be laid to connect the Northern and Southern State

Parkways. Paving consists of two 24-foot reinforced-concrete roadways, separated by a grassed median varying from 1 to 35 feet wide. The extension will have outside curbed shoulders 8 feet wide and acceleration and deceleration lanes for exit and entrance ramps. These ramps differ from the roadway pavements in that they consist of two 10-foot lanes.

Though the width of excavation varied, the average came to 1,000 feet, and most of it was sand. The largest cut made for the roadway excavation was 18 feet deep and 700 feet wide. As soon as this work started, Hendrick-



A more efficient dragline bucket scoops up bigger profits for you. Omaha Dragline Buckets eliminate unnecessary weight making room for a bigger payload. Time and dollar consuming field repairs are reduced. You can't put a better bucket than an 'Omaha' on any job.

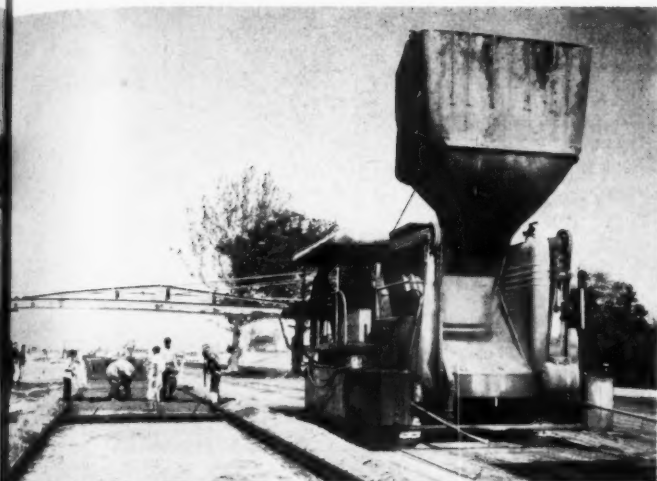
Write today for  
catalog giving  
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four types available.

**DRAKE-WILLIAMS MOUNT • OMAHA, NEBR.**

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CONTRACTORS AND ENGINEERS





Riding on the median strip, a Rex dual-drum paver places concrete in a 12-foot lane. Concrete is struck off manually so that reinforcing can be put down before the top 2½ inches of concrete is placed.

## Highway widening and concrete paving

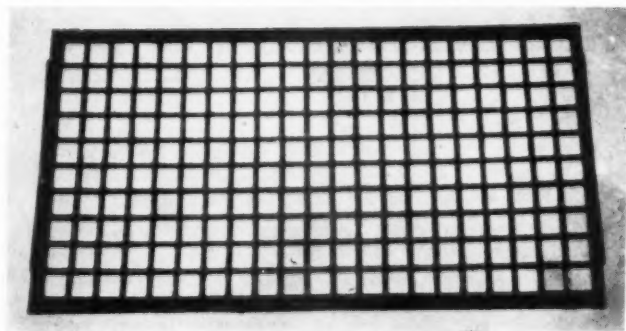
son got busy on structure excavation. This amounted to more than 142,000 cubic yards for the 14 overpasses and underpasses on the stretch. All but 80,000 cubic yards of peat muck excavation was used on fills. The peat muck, stockpiled for use as a stabilizer for the grassed median strip, was removed by a Lima dragline and loaded into Caterpillar bottom-dumps and scrapers for stockpiling. This excavated area was backfilled by a fleet of Caterpillar D7, International, and Allis-Chalmers tractors with dozers.

Roadway excavation was spurred by two shovels that loaded scrapers and

bottom dumps. The largest, powered by a GM diesel, was a Bucyrus-Erie 71-B with a B-E 3½-yard bucket. The other was a P&H with a 3-yard bucket. These two were kept busy loading six Caterpillar DW20 bottom-dumps, six Caterpillar DW21 scrapers, three Cat 90 scrapers pulled by M-R-S 190 tractors, and two Cat 80 scrapers pulled by LeTourneau tractors. Shovels were used to load all these units, since the contractor found it more economical to have only one type of loading operation on the fill.

All this rolling stock helped compact (Continued on next page)

## This Mold Will Pay For Itself In A Very Few Days



The use of Martin Steel Concrete Molds in Reinforced Steel Erection saves contractors at least 50% of the cost of steel bolster chairs.

These blocks are being successfully used on flat slabs, lift slabs, tube slabs, pan slabs and bridges. The use of concrete blocks eliminates the rust spots on ceilings generally left when bolster chairs are used.

With proper care and oiling after use, these molds will last for years. Sold in sets of three which will take care of beams and slabs from 2" to 10". Immediate delivery. Call or write

**Martin Steel Concrete Mold Fabricators** 109 Rockwood Ave.  
Tel. ELmhurst 1-3422 Cranston 9, Rhode Island

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## IDEAL<sup>®</sup> for all wire tying jobs



Here's a REEL that's an "IDEAL" money saver

FOR TYING REINFORCING STEEL, METAL LATH, WELDED WIRE FABRIC, AIR DUCT COVERING, PIPE INSULATION, AND OTHER WIRE APPLICATIONS.

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## Toughens up fast... Seals joints that last

## FLINTSEAL<sup>\*</sup>...use it for old and new pavement

There's no traffic hold-up when you re-seal the joints of old pavements with Flintseal hot-poured rubber asphalt thermoplastic compound.

Normal traffic is resumed quickly because Flintseal toughens up as soon as it cools to air temperature. Within 15 to 30 minutes.

And Flintseal gives you positive, dependable sealing of all joints and cracks. It doesn't flow or extrude in summer . . . crack or pull away in winter. Flintseal bonds perfectly through all extremes of weather. Prevents water and dirt from getting under pavements . . . far more effectively than old-style tar and asphalt fillers.

Use Flintseal for concrete highways, streets, drives, bridge decks and airports. Count on this compound to keep maintenance costs down. One application will last for years and years. (Meets Fed. Spec. SS-S-164.)

Flintseal JFR, a special jet-fuel-resistant joint sealer is available for critical areas of airfields. (Meets Fed. Spec. SS-S-00167.)

Ask for literature and application data for Flintseal (regular) and Flintseal JFR (jet-fuel-resistant).

<sup>\*</sup>Reg. U. S. Pat. Off.



## FLINTKOTE



THE FLINTKOTE COMPANY, INDUSTRIAL PRODUCTS DIVISION  
30 Rockefeller Plaza, New York 20, N. Y.

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In Toronto, Ontario: THE FLINTKOTE COMPANY OF CANADA, LTD.  
In London, England: Industrial Asphalts Company, Ltd.

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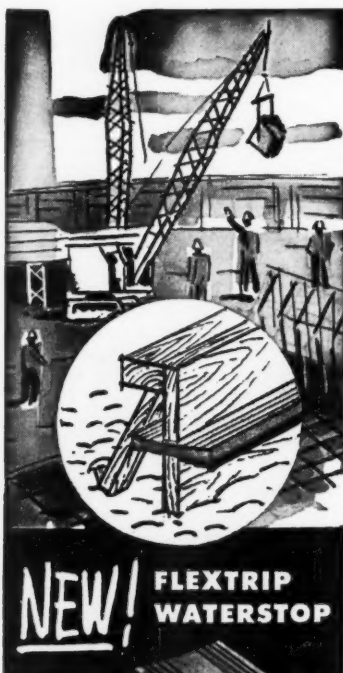
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the fills to a 98 per cent density as they made average 18,000-foot hauls. Oscillating-wheel rollers completed the compaction work and three graders—an Austin-Western, an Adams, and a Caterpillar—brought the roadway to final grade.

Additional equipment on the job included a Michigan truck-crane, two P&H truck-cranes, a P&H crawler-crane, and a Lima crane with a clamshell bucket. These excavated for trenches, culverts, and bridges. A Hough Payloader backfilled the structures, while Jackson tampers and oscillating-wheel rollers handled back-fill compaction.

The biggest problem on the project—the presence of ground and rain

A Jaeger double-screed transverse finisher levels off the concrete to a depth of 8 inches. The dark color of the material is due to carbon black, added to batches so that the pavement will diffuse light and absorb heat.



## THE LATEST VINYL PLASTIC WATERSTOP

for "wall-floor" and "between-pour" horizontal concrete construction joints

Water just can't get through joints protected by FLEXTRIP, the all-new, strip-type waterstop. Unique concave shape plus ribbed edges give FLEXTRIP a never ending grip in the concrete . . . is flexible enough to withstand extreme joint-separation (more than 3 inches) yet rigid enough to stand up to the battering effect of pouring concrete. Here's lasting joint-protection unmatched by any other waterstop. What's more, FLEXTRIP will never rust, rot, check or crack and is unaffected by acid, alkalies, petroleum products, chemicals or the most adverse atmospheric conditions . . . lasts as long as the concrete. Write for additional information on FLEXTRIP and other vinyl waterstops. Send coupon below.



Made by the makers of LABYRINTH WATERSTOPS . . . the standard waterproof on outstanding construction jobs everywhere — eliminates seepage problems . . . simplifies form work.

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Without obligation, please send me information on your new FLEXTRIP and LABYRINTH WATERSTOPS.

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water in the very porous sandy material—was overcome by the use of a wellpoint system with a 6-inch pump. This setup removed water along the roadway excavation, and smaller pumps were installed to get water out of culvert, trench, and bridge excavations.

### Paving operations

After grading and structure work, moving northward, had passed the midpoint of the 8-mile stretch, paving started on the northbound roadway, working from the midpoint of the project to the southern end. This prevented paving and earthmoving operations from interfering with each other and made it possible for the contractor to complete a substantial amount of paving before last season ended.

Paving, subcontracted to John C. Peterson Construction Corp., Baldwin, Long Island, is being done in 12-foot widths in sections where grading and structures are complete.

About 8,000 feet of forms are being used by Peterson, with 2,400 feet of them being kept in place ahead of the Rex paver. The 8-inch forms are held in place in the manually prepared form trench by steel form stakes driven by

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CLAMSHELL BUCKET



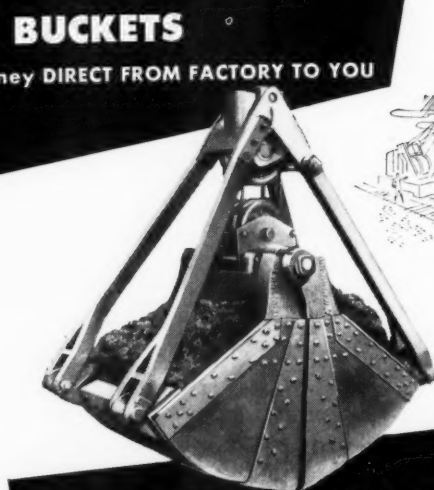
LOCOMOTIVE CRANE



COAL-ORE BRIDGE



ORE UNLOADER



ROPE REEVE, POWER WHEEL AND LINK TYPE

WRITE FOR ILLUSTRATED CATALOGUE

**INDUSTRIAL BROWNHOIST CORPORATION**

BAY CITY, MICHIGAN

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# Keep Worker Efficiency Up!

...keep cool drinking water on the job with



## WATER BOY portable water coolers

Keep workmen on the job by keeping sparkling pure, refreshingly cool drinking water on the job. Efficiency goes up when Water Boy Portable Coolers are kept handy on every type of construction and maintenance work.

Water Boy Coolers are big, rugged, built to take abuse. They feature double-locked seams and bottoms, brass-nickel plated recessed faucets, fully

enclosed or open-rimmed covers. There's the new SPARKLEEN liner, too, that keeps water sparkling clean, odor-free and taste-free.

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CONTRACTORS AND ENGINEERS





◀ The last rig in the paving train is this Koehring longitudinal finisher. After it passes by, the concrete surface is finished with hand lutes and a burlap drag.

hand. Stakes are removed manually during stripping operations. The forms used in paving the outside lanes for both roadways have keyways on the inside and outside edges, so that they lock with the adjacent lane and the concrete curb.

After a Galion 10-ton three-wheel roller gives a final compaction to the grade, a scratch board is used to make sure the grade is true. A Rex dual-drum paver, pulling a 2,000-gallon water tanker, generally works outside the forms, but in areas where the median is so narrow that this cannot be done, the paver works within the forms until the median widens again.

Using its 35-foot boom and 1.44-cubic-yard single-gated bucket, the paver deposits concrete batches on the grade and ahead of the Jaeger double-screed transverse finisher. Here the concrete is spread to a 5½-inch thickness by workmen using shovels and a strikeoff board that is moved along the forms to check the desired thickness of the concrete. When this is done, wire mesh is placed on the fresh material so that the reinforcing will be 2½ inches below the surface of the completed slab.

As soon as the mesh has been placed, concrete is deposited over it and the Jaeger finisher makes the first of two passes to bring the concrete to the required thickness of 8 inches. Behind the Jaeger, a Koehring longitudinal floating machine is being used. Workmen with hand lutes and a burlap drag apply the finish.

When concrete has attained initial set, Sisalkraft paper is placed over it for curing purposes. This allows form stakes to be removed and forms to be stripped after 24 hours. As soon as they are removed, the forms are loaded onto trucks and moved ahead to an area where they are needed or, if paving cannot continue on the same lane, to entirely new locations.

Roadway joints, spaced at 100 feet, are of a non-extruding-type bituminous filler board having a removable metal cap so that paving can be done continuously. The metal cap is removed before concrete has attained initial set, and the void is sealed later with an asphaltic filler. Each filler board also supports 12 evenly spaced steel dowels so that adjacent slabs are tied structurally together.

#### Batch plant setup

Concrete for the paving spread,  
(Concluded on next page)

### ROCK PROBLEM? Here's your speedy, low cost answer



### Bestland Hydraulic ROCK PICKER IN WORLD-WIDE USE

on pipeline projects, Long Sault Dam, Tiber Dam, Palisades Dam, Campbell River Hydro, etc.

Rocks in foreground were picked by the BESTLAND ROCKMASTER in this picture.

The speedy, rugged Bestland Rockmaster picks small rocks to huge boulders. Just pull a lever to raise the loaded tines to hopper box and to discharge hopper box load to truck. You never leave the tractor seat. Adjustable tine spacing on all models. Mfd. by Self Mfg. Co., Twin Falls, Idaho.

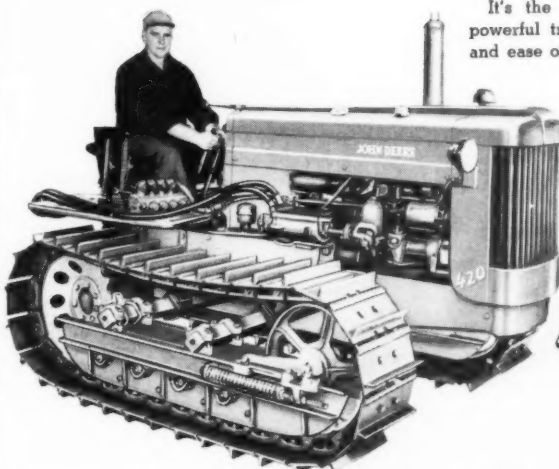
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BILLINGS, MONTANA

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## In a John Deere Crawler You Get SO MUCH for SO LITTLE



**WHY** buy tractors that are bigger than you need? Contractors and builders everywhere are awakening to an important fact—there's a place for this light, economical, track-type tractor to handle a wide range of jobs. And, once they own a John Deere, they wonder how they ever got along without it!

It's the compact, but amazingly powerful tractor with the simplicity and ease of handling that feature all

John Deere Tractors, a tractor that will work and earn for you every month in the year. With approximately 25 h.p. on the drawbar, it makes short work of land-clearing, excavating, backfilling, clean-up and landscaping. It solves material-handling problems, excavates for footings, sewer, gas, and power lines and septic tanks—almost no end to its uses! Get complete information. See your nearest John Deere dealer.

Left: The new "420" Crawler with 4-roller tracks. Also available with 5-roller, above. Both tractors now have 20 per cent more power than previous models.

### Send for FREE Literature

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(Continued from preceding page)

which put down as much as 2,500 linear feet of 12-foot lane in an 8½ hour work day, is delivered by 14 batch trucks having capacities of 5 or 6 batches each. The portable batch plant, located at about the middle of the job and adjacent to a rail spur, is operated by a commercial firm, Preferred Transmix Concrete, Inc., Hicksville, Long Island.

At the plant, a Northwest crane with a 60-foot boom and a 1½-yard clamshell bucket charges the 4,500-pound three-compartment Erie aggregate bin. An Allis-Chalmers HD-7 assists the crane in maintaining and shaping the stockpiles. Stockpiles consist of three sizes of aggregates—1½-inch stone, ¾-inch stone, and

sand—which are delivered to the plant in 18-yard trailer trucks.

Bulk cement is delivered by bottom-dump rail cars, which empty over a screw conveyor. A 65-foot enclosed elevator picks up the cement from the screw conveyor and transfers it to the Erie 600-barrel cement silo. Both the aggregate bin and the cement silo are of the drive-through type, so that batch trucks can drive under the aggregate bin first and receive 1,511 pounds of sand, 1,276 pounds of 1½-inch stone, and 1,584 pounds of ¾-inch stone per batch. These quantities are weighed by a Buffalo beam scale and manually released.

After the correct quantities of aggregate are dumped for each batch, the trucks drive to the cement bin, where 846 pounds of cement is added

to each batch. This quantity is weighed by an electrically-operated scale and released by a push-button control. Approximately 15 pounds of carbon black is added to each batch of concrete to obtain a blackish-gray finish in the roadway slab. This will diffuse the sunlight on the pavement and increase the heat-absorbing qualities of the pavement.

An additional 50 ounces of Darex air-entraining agent per batch is added to the mix after each batch has been dumped into the skip. Water obtained from metered fire hydrants is added at the paver in amounts varying from 20 to 25 gallons per batch.

Supervisory personnel located throughout the project have RCA mobile radio units in their cars and

pickups to keep them in touch with the field office, which has an RCA base unit.

#### Personnel

Fleetwood Sammis is the superintendent, and Donald Hand the project engineer, for Hendrickson Bros. Al Ramon is the project engineer representing the consulting engineers, Andrew, Clarke, & Buckley, New York, N. Y. Bill Myers, superintendent for John C. Peterson Construction Corp., has Eddie Rostoczynski as his paving foreman.

THE END

May has been designated United Cerebral Palsy Month. "Help today and hope tomorrow" is the organization's slogan—make it come true by contributing to your local Cerebral Palsy Fund.



Trees and brush too small or thick for efficient removal without excessive dirt moving? Equip your tractor with a Fleco Root Cutter to effectively slice through trees up to 11" in diameter and brush at bud ring depth for a complete kill. The Fleco Root Cutter can be adjusted to undercut from 3" to 24" deep. Cut trees can be left on the ground to decompose to humus or raked into piles and burned. On a tractor with a double drum cable control, a rear mounted tool bar root cutter does not interfere with front mounted rakes, stumpers or 'dozers. In certain conditions, a crawler equipped with Fleco Root Cutter and rake has *twice* the clearing capacity of one equipped with a blade alone.

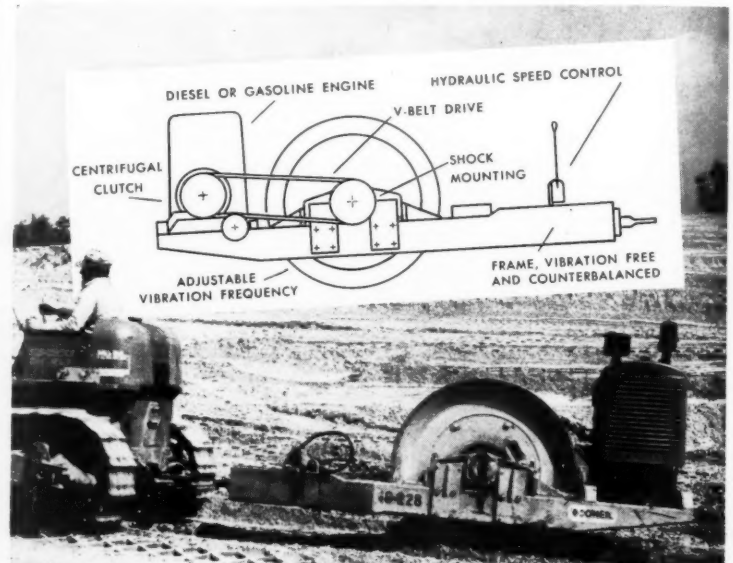
See your Fleco Dealer—who is also your Caterpillar Dealer—for complete details!

# FLECO

FLECO CORPORATION  
Jacksonville, Florida

ROCK, ROOT & BRUSH RAKES  
TREE CUTTERS • UNDERCUTTERS  
CAB GUARDS • ROOT CUTTERS  
DETACHABLE & PULL STUMPERS  
TREEDOZERS • ROLLING CHOPPERS

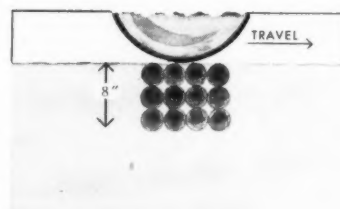
For more facts, use Reader-Reply Card opposite page 18 and circle No. 399



NEW CONCEPT IN COMPACTION!

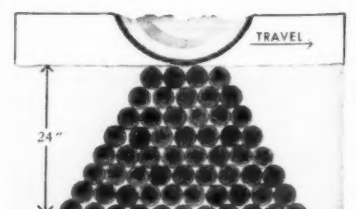
## VIBRO-PLUS TERRAPAC VIBRATORY ROLLER

"Terrapac" compacts faster, better and deeper in fewer passes than ordinary 30-50 ton rollers yet weighs only 3½ tons. Saves hours of valuable time because maximum density can usually be achieved in only 2 passes . . . Light enough to be easily handled on any fill or for quick transport . . . Also useful as a static roller if desired.



CONVENTIONAL  
STATIC COMPACTION

Rollers relying on weight alone produce friction forces between individual soil particles that prevent densification at any great depth.



TERRAPAC  
DYNAMIC COMPACTION

Vibratory forces, transmitted to soil in all directions, reduces friction—facilitates relocation of particles at far greater depths.

An actual field test under State Highway supervision showed that a specified 100% standard proctor density could be obtained at a 24" depth after 2 passes with a "Terrapac". . . A 15 ton smooth roller required 20 passes to obtain specified density at only an 8" depth!



## VIBRO-PLUS

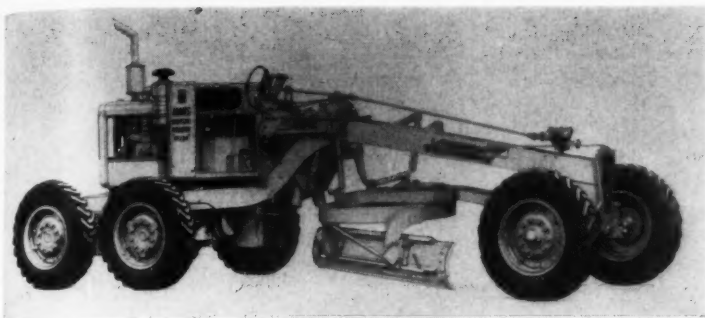
PRODUCTS, INCORPORATED

STANHOPE, NEW JERSEY No. 41-6

For more facts, use Reader-Reply Card opposite page 18 and circle No. 400

CONTRACTORS AND ENGINEERS





The new Adams Model 220 motor grader is powered by a 60-hp diesel engine.

### New grader features hydraulic gear system

■ A new Adams motor grader, the Model 220, has been announced by LeTourneau-Westinghouse Co. Powered by a 60-hp diesel engine and weighing 14,865 pounds, the new machine is designed primarily for general grading and road maintenance.

Among features of the 220 is a teaming of hydraulics and mechanics in a hydra-power gear system which powers both lift and lateral shift of the blade. Said to be a simple system employing hydraulic power for ease of operation and mechanical torque for speed and positive action, it uses gears to convert the thrust of hydraulic rams to mechanical turning power. Because these gears provide a 3 to 1 multiplication, the operator is able to get three times the movement ordinarily accomplished by conventional ram action, according to the manufacturer.

Like larger Adams models, the new grader provides a broad range of standard operating speeds, plus additional extra-slow rates through optional creeper gears. The standard sliding-gear transmission provides five forward speeds from 1.8 to 18.3 mph.

The optional creeper gears add four more speeds from 0.28 to 0.96 mph for finish-grading in tight places, tough rooting jobs, and other difficult applications where it might otherwise require slipping the clutch or reducing engine power to permit the necessary slow operation.

Other important features include a hydraulic-mechanical circle reverse mechanism which revolves the blade under the scarifier block to any angle within a full 360 degrees; power-controlled leaning front wheels; and hydraulic brakes on front tandem-drive wheels with mechanical parking brake on transmission.

The 220 is 22 feet 9 inches long and 7 feet 3 inches wide. The 60-hp diesel power plant is a GM 2-cycle 4-51 unit. Optional equipment includes 10 and 12-foot power-shift and 12-foot slide-shift moldboards, nine-tooth scarifier, creeper gears, and top—with or without enclosures.

For further information write to LeTourneau-Westinghouse Co., 2301 N. Adams St., Peoria, Ill., or use the Request Card at page 18. Circle No. 131.

### Col. Trower joins Kaiser as executive assistant

Col. Wendell P. Trower (ret.) has joined the Kaiser engineers division of the Henry J. Kaiser Co., Oakland, Calif., as assistant to the vice president. He had been division engineer for the Great Lakes and North Central Divisions of the U. S. Army Corps of Engineers for the past five years.

While associated with the Corps of Engineers, Col. Trower supervised the design and execution of extensive military and air force construction programs in the Great Lakes area and also worked on studies for the redevelopment of power on the Niagara River.

Col. Trower also did a great deal of work on the design and construction

of the St. Lawrence Seaway development.

### Earth excavator

■ The multipurpose Gradall with hydraulically-operated telescopic boom is featured in a new catalog. Parts pictured are the boom, self-contained power unit, turntable and rotating platform, operator's cab, remote control, and carrier. Action shots point out the rig's use in highway ditching, trenching and backfilling, ditch cleaning, sloping and grading, and pavement removal.

To obtain this catalog write to Gradall Division, The Warner & Swasey Co., 5701 Carnegie Ave., Cleveland 3, Ohio, or use the Request Card at page 18. Circle No. 64.



## MUD? DRY IT OUT WITH ROME DISK PLOWING HARROWS!

Heavy rain last night — mud this morning? A few hours cutting and aerating the site or haul road with a crawler tractor and Rome Disk Plowing Harrow can save the day! On the cut a Rome loosens and dries material to full scraper-blade depth, facilitating loading. On the haul road, it fills in ruts, helps dry out the slick surface. The Rome Disk Plowing Harrow can be hitched or unhitched from the tractor drawbar in seconds, immediately releasing the tractor for other work.

Rome Disk Plowing Harrows are ideal contractors' machinery for blending in-place materials or soils, for stabilizing road shoulders, dam fills or bridge sites. These multi-purpose machines can reduce your equipment investment, cut operating costs, speed up production.

Rome Disk Plowing Harrows can speed up land clearing, too, cutting out brush and springy young trees too flexible for efficient 'dozer work.

Your Rome-Caterpillar Dealer will gladly help you select the machine you need for your project. See him soon!

**ROME PLOW COMPANY, Cedartown, Georgia**

*Rome Disk Plowing Harrows*

For more facts, use Reader-Reply Card opposite page 18 and circle No. 402

**SARGENT Makes Only One Size . . .**

**THE EXTRA HEAVY DUTY 3/8 YARD**  
*Sargent* **MODEL 410**  
**SHOVEL-CRANE**

If your present shovel-crane line doesn't include a 3/8 yard machine, SARGENT is not competitive.

Write for complete information, specifications and prices to:

**SARGENT ENGINEERING, INC.**  
Fort Dodge, Iowa



SHOVELS • DRAGLINES • TRENCH HOES • CRANES  
TRUCK OR CRAWLER MOUNTED

For more facts, use Reader-Reply Card opposite page 18 and circle No. 401

A Caterpillar motor grader, with a scarifier attachment, blades some material to bring the roadway to grade. This rig also scarifies the old roadway material to a 6-inch depth. ►




write for further information  
**Swenson Spreader & Mfg. Co.**  
Lindenwood, Illinois

**Speed Sealcoating Jobs  
with  
SWENSON SPREADERS**

For more facts, use Reader-Reply Card opposite page 18 and circle No. 403

## Base work with soil cement cuts street costs by one-third

Anyone coming back to Tipton, Ind., after having been away a few years would hardly recognize the city's streets. Soil cement, surfaced with blacktop, has replaced 16 miles of worn-out roadways, and the entire job was completed at about one-third the original cost estimated for the work.

Largely responsible for the savings was the use of soil cement, which was adopted after costs, qualities, and durability of various types of paving were compared. Though comparing closely with flexible macadam, soil cement was chosen because it offered solidity, and because with it, the contractor could use all the gravel that had been placed on the streets in previous years. Altogether, 6 to 14 per cent cement was enough to stabilize the base, while mixing the material in place reduced handling expenses.

Until this work was started, Tipton learned the hard way that expensive patching jobs were not enough to turn bad streets into good ones. Of the town's 22-mile street system, two miles are the responsibility of the



The most important date for the  
Construction Industry in 1957

**JAN 28  
1957**

**A.R.B.A.  
ROAD SHOW  
and CONVENTION  
PLAN NOW!**

1957 will bring with it the first Road Show to attract 10 years' experience. New equipment, new methods, new materials have been developed. New methods have been developed. Here is the time and place to keep your eyes up to date on all the new developments.

Nothing is being spared to make this 1957 Road Show the greatest show yet gathered together. At the same time the A.R.B.A. convention will give you an opportunity to learn about new methods and practices and how understanding authorities discuss the solution of problems that are bothering you.

Put it down as the most important date for the construction industry in 1957. Write for facts on conventions. Ask to be put on the list to receive future information on the 1957 A.R.B.A. Road Show and Convention.

**A.R.B.A.  
ROAD SHOW**

**AMERICAN ROAD BUILDERS' ASSOCIATION**  
World Center Building  
Washington 6, D.C.

## A.R.B.A. ROAD SHOW and CONVENTION, International Amphitheatre, Jan. 28 to Feb. 2, 1957

Here in Chicago everything is being done to make the coming A.R.B.A. Road Show and Convention an event that will be remembered for its value as an instructive conference, a helpful equipment show and its pleasures. Chicago's vast hotel setup is being organized to care for the large attendance that will be present. The International Amphitheatre is the largest exhibit hall in the Country and will provide an ideal spot for gathering and viewing the over 1,000 pieces of equipment that will be shown.

The Stock Yards Inn with its many eating places and cocktail lounges, and the cafeterias in the Amphitheatre, assure comfortable restaurant facilities.

Free Bus Service from the main hotels will assure adequate transportation and permit attending convention sessions regularly and at the same time allow you to spend time at the show.

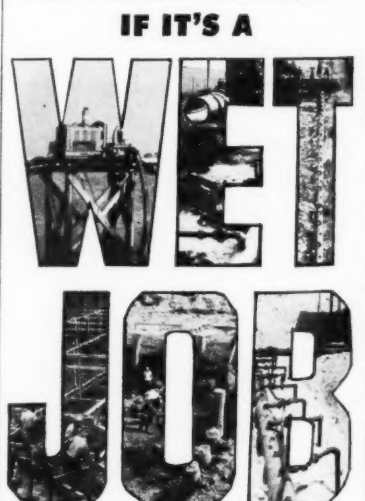
Add to all this the many attractions that Chicago always provides.

Remember the place—the date—and make your plans. Ask to be put on the list to receive future information on the 1957 Road Show and Convention.

**AMERICAN ROAD BUILDERS' ASSOCIATION**  
World Center Building Washington 6, D.C.



For more facts, use Reader-Reply Card opposite page 18 and circle No. 404



**PLAY SAFE! ASK FOR A  
DEWATERING ANALYSIS BY**



**WELLPOINT CORP.**

881 East 141st Street, New York 54, N. Y.  
Hammond, Ind. Houston, Tex. Jacksonville, Fla.

In Canada: Construction Equipment Co., Ltd.  
Toronto Montreal Halifax

For more facts, circle No. 405

**CONTRACTORS AND ENGINEERS**





While portland cement is dumped onto the road from the truck, a Seaman Pulvi-Mixer blends the soil and cement. About 6 to 14 per cent cement was enough for this stabilization job.

**Stabilization is done with gravel placed during previous years; new pavement will minimize maintenance expense in future years**

Immediately after the mixing operation, the base is compacted by a sheepfoot roller pulled by a Cat HT4 Tractor. Pneumatic and steel-wheel rolling will follow after the base has been smoothed by a motor grader.

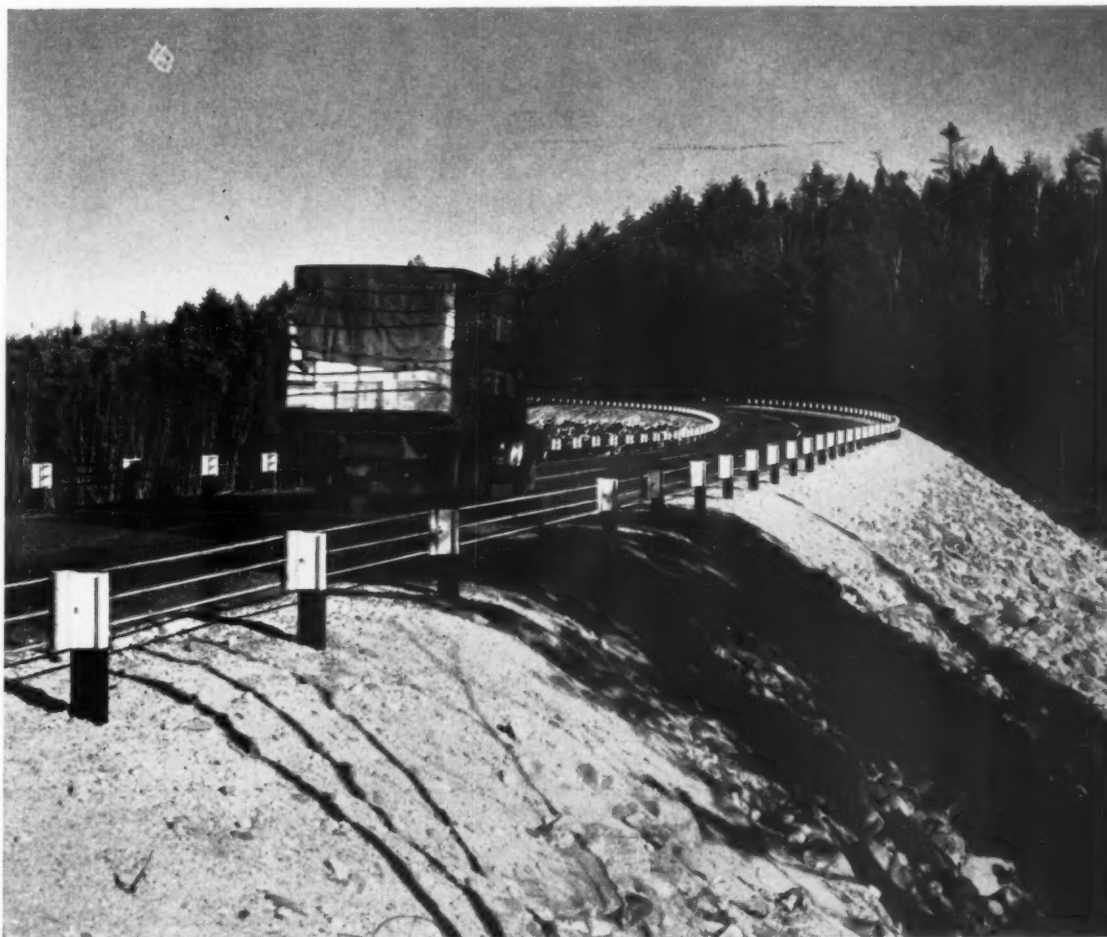


State Highway Department. Eight miles consisted of high-grade pavement in need of immediate resurfacing, 4 miles were in fair to poor condition, and the remainder were unimproved. One summer, \$8,500 worth of materials alone went into street work. And in a preceding decade, \$93,000 had been spent without visible result.

When a report on street conditions showed that money was merely being thrown away by trying to build good streets through repair jobs, the town went ahead with paving 16 miles of the system. With the soil cement put down at a cost of 48 cents per square yard, cement bid at \$3.69 per barrel, and hot-mix surfacing costing \$7.99 per ton, the cost of the work was done within the budget of the town, coming to roughly one-third the \$329,500 originally estimated as the cost of such a reconditioning job.

#### Grade prepared

Roadways were first scarified to a depth of 6 inches by a Caterpillar  
(Concluded on next page)



## Protect Highway Danger Spots With Bethlehem Cable Guard Rail

Used at sharp turns, embankments, bridge approaches and other danger spots along the highway, Bethlehem Cable Guard Rail forms a strong, effective barrier, with high resiliency and impact-absorbing qualities.

You can be sure of dependable protection for motorists when you install Bethlehem Cable Guard Rail. For this strong steel highway guard is designed to meet the demands of modern traffic, with its heavier volume and higher speeds.

Bethlehem Cable Guard Rail, with its special bumper-type bracket, is simple in design, easy to install, and low in cost. It requires little maintenance, can be used with either steel, wood or concrete posts, and is furnished to comply with any state regulations. It comes with 2, 3 or 4 cables, and with 1-, 1¼- or 1½-in. anchor rods. Bethlehem furnishes cable guard rail, together with steel posts, brackets, cable ends, anchor rods, cable splicers and fittings, all

of which assemble readily on the job.

If you would like to have more information about Bethlehem Cable Guard Rail or the solid-beam type of guard rail which we also make, just call the nearest Bethlehem sales office, or write to us at Bethlehem, Pa.

**BETHLEHEM STEEL COMPANY**  
BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by  
Bethlehem Pacific Coast Steel Corporation  
Export Distributor: Bethlehem Steel Export Corporation

**BETHLEHEM STEEL**



For more facts, use Reader-Reply Card opposite page 18 and circle No. 407

### NOTICE TO BUYERS OF NEW ROTARY SWEEPER BROOM CORES

We Manufacture NEW Cores of the following types:

★ LITTLEFORD ★ DETROIT-HARVESTER  
★ HOUGH ★ GRACE ★ ROSCO  
★ FORDSON ★ SPEARSWELL ★ LULL  
★ HUBER ★ MEILI-BLUMBERG

(Special Cores Made to Order)

We Rebuild Repair all Makes Types- Sizes



Immediate Shipment SAVE MONEY

Suggestion! Buy Cores without any filling or we can furnish filled with steel spring wires—Bass—Palm or Hickory Fibres.

**ROAD BUILDERS IT'S SENSATIONAL! !**

**BIG PECKERWOOD BIG**

Steel (or Fibre) road drag levelers Made in any c-o-n-t-i-n-u-o-u-s length up to 12 feet. 6 inches wide—kiln dried hardwood

**NO FRAME REQUIRED**

We offer also (not illustrated) The LITTLE PECKERWOOD unit steel wire drag 3" x 15". Fits standard frame

Road Contractors Headquarters Since 1928  
**VAN BRUSH MFG. CO., INC.**  
327 Southwest Blvd., Kansas City 8, Mo.

For more facts, circle No. 406

(Continued from preceding page)

motor grader equipped with a scarifier, and brought to grade. In places where the grade had to be lowered, top material was bladed into a wind-row at the side so that underlying material could be removed. In places where the roadway had to be widened, gravel was added to the roadway and spread by the motor grader.

After the scarified material had been thoroughly pulverized by a Seaman Pulvi-Mixer, cement was added, generally in bulk. Then the Seaman machine blended the soil and cement in place, while a pressure distributor, working out in front, moistened the materials. Water was added until the material contained the optimum content. In this state, the mixed material

will form when it is squeezed in the hand, but will not yield any water.

A sheepsfoot roller, pulled by a Caterpillar HT4 Traxcavator, compacted the mixture. A motor grader then scraped the surface lightly with its blade before final compaction was applied by a pneumatic roller and a steel-wheel roller.

The smooth base resulting from this work saved an estimated 5 pounds of hot-mix per square yard, an amount that would have been used if the base was uneven and had to be smoothed out by the use of some additional hot-mix.

A cutback asphalt, used to cure the base, was covered with rock chips. After about three or four days, recently completed sections were opened to traffic.

#### Special work

Since this work was done in a populous area, special problems had to be met and solved. Manhole castings were removed before work on the base started, and replaced by heavy wood coverings so that processing was done right over them. Later the manholes were located and cut open so that the rings could be replaced. The result of this operation was a smooth, finished job.

In some sections of the town, where quicksand is located under the street, the roadway was strengthened before work began. The top 6 inches of material was first removed, a 4-inch sub-base of soil cement put down, and this topped with regular base construction.

THE END



## Contractors praise performance of new portable earth tamping machine

... and it's no wonder! Travelling 15 to 45 feet per minute, the self-propelled JAY TAMPER delivers more than twenty-two hundred 1800-lb. impacts per minute. That's applying more pressure per square inch than a ten-ton roller. And that's making easy, smooth, fast and efficient work of the toughest tamping jobs ... all the time it's saving you money.

Contractors tell us the JAY TAMPER is the long-awaited answer to many of their tamping tasks ... like tamping right smack next to abutments, properly keyseating (to uniform proctor densities, too), after any type of backfill ... and hosts of other applications.

Why not write, right now, for a demonstration of the Jay Tamper and how it can save you money on your job—large or small.

### Check these features:

- One man will easily outwork a 5-man air compressor crew
- Eight full hours work on just 2 gallons of gas
- Combines vibration and impact to properly keyseat all materials
- Portable ... removable handle permits loading into auto, station wagon, light truck
- Delivers more than twenty-two-hundred 1800-lb. impacts per minute
- Low investment

The **JAY** Corporation

177 HOSACK STREET,  
COLUMBUS 7, OHIO

- ☐ Yes, I want a demonstration of the Jay Tamper  
☐ Send more information

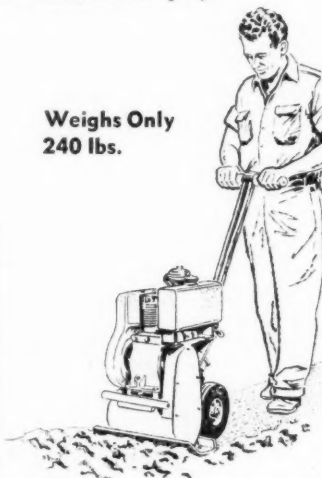
Name ..... Title .....  
Company .....  
Street .....  
City ..... Zone ..... State .....

For more facts, use coupon, or Reader-Reply Card opposite page 18 and circle No. 408

These ... and many other contractors now using the handy JAY TAMPER:

The Austin Company  
Beaumont Bridge Company  
F. C. Braun & Company  
H. K. Ferguson Company  
Hinkle and McCoy  
Hunkin-Conkey Construction Co.  
Morrison-Knudsen Constr. Co.  
The Texas Company  
Texas Bitluthie Company

Weights Only  
240 lbs.



#### Six-wheel trucks

■ International six-wheel trucks—both conventional and cab-over-engine models—are featured in a 24-page color catalog. Parts pictured are the Black and Red Diamond truck engines, rubber-bushed tandem-drive bogie assemblies, chassis, tandem axles, brakes, power steering, and turbocharged and supercharged engines. As straight trucks or as tractor-trucks, these six-wheelers have a gvwrating from 22,000 to 60,000, according to the catalog.

To obtain this catalog write to International Harvester Co., 180 N. Michigan Ave., Chicago 1, Ill., or use the Request Card at page 18. Circle No. 101.

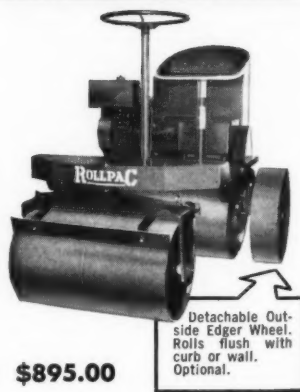
#### Safety Council releases construction statistics

The Greater New York Safety Council, at its 26th annual convention at the Hotel Statler, New York City, claimed that one out of every seven dollars spent in the United States is for some sort of construction. One out of eleven construction workers suffers a disabling injury and one in each thousand is killed on this work.

In 1954, the construction industry did \$50,000,000 worth of business. That same year, 2,600,000 construction workers were employed, 2,500 of whom were killed in accidents and 240,000 disabled.

#### Fairbanks, Morse appoints

L. A. Weom has been made manager of the Pump Sales Division of Fairbanks, Morse & Co., Chicago, Ill. Succeeding the late Tom E. Woodruff, he will make his headquarters at Kansas City, Kans. Before being named to the post, Weom was manager of materials and schedules at the Beloit, Wis., works.



\$895.00

A Standout Popular-Priced  
One Ton Roller. Send for  
Catalog.

**ROLCOR** Industries

1208 2nd Ave. So. Minneapolis 3, Minn.  
Sold by over 95 distributors in United States and Canada

For more facts, circle No. 409

CONTRACTORS AND ENGINEERS





Wearing the conventional hard hats, Pete and Tom LaHache, two of the eight Mohawk Indian braves working on the construction of a New York skyscraper, signal to Dominick Rice, posing in the traditional Indian headdress.

### Mohawk Indians work on office construction

Eight Mohawk Indians are working as ironworkers on the construction of a new skyscraper at 425 Park Ave., New York, N. Y. Working with the erecting department of American Bridge Division of United States Steel Corp., Pittsburgh, Pa., the eight men commute to the job from the North Gowanus section of Brooklyn, where almost 5,000 members of the tribe reside.

Because of their agility and quick reflexes, Indian tribesmen have been working as structural steelworkers since 1886, when the Dominion Bridge Co. employed them on the construction of a railroad that crossed through their village in Caughnawaga Reservation, on the St. Lawrence River, near Montreal.

The building on which they are now working is a 31-story, fully air-conditioned structure being built by the George A. Fuller Co., New York, N. Y. American Bridge Division is fabricating and erecting the steel framework for the structure.



"Is it too late, Doctor?"

It's not too late for Americans who go to their doctors at the first sign of any one of cancer's 7 danger signals: (1) any sore that does not heal (2) a lump or thickening, in the breast or elsewhere (3) unusual bleeding or discharge (4) any change in a wart or mole (5) persistent indigestion or difficulty in swallowing (6) persistent hoarseness or cough (7) any change in normal bowel habits.

Guard yourself against cancer. Phone the nearest office of the American Cancer Society or simply write to "Cancer."

American Cancer Society

For more facts, circle No. 410

### Bixby joins N. Y. Trap Rock on retiring from state post

James S. Bixby, who retired the first of this month as district engineer for the New York State Department of Public Works, has joined the New York Trap Rock Corp., New York, N. Y., as a consultant. He will assist the firm with technical matters and with community relations.

Upon graduation from the University of Vermont with a degree in civil engineering, Bixby started working for the State of New York as a surveyor's rodman. Two years later, in 1910, he became a member of the 3-man commission that was organized as the first State Highway Department.

He served as district engineer since

1924. During his service with the state, he saw New York's roads grow from a total of 1,800 miles to the 15,000 miles that are today under the jurisdiction of the Department of Public Works.

### Chairman of the board honored by Raymond firm

Maxwell Mayhew Upson, chairman of the board of Raymond Concrete Pile Co., New York, N. Y. since 1946, was honored at a dinner marking his 80th birthday and his 50th year as a constructor and engineer. Held in New York City's Waldorf Astoria Hotel, the dinner was given by employees of the Raymond firm.

Upson, who joined Raymond in 1907, was formerly president of the firm.

# COMPARE

**LORAIN-Dixie**  
FOR 3/8-YD. SHOVEL-CRANE  
VALUES!



This Lorain-Dixie equipped with 3/8-yd. clamshell bucket moves up to 500 yards a day, digging catch basins on a 7000-ft. storm sewer. Also lays up to 300 ft. of pipe in 8 hours. The "Dixie" is the only crane on the job.

#### COMPARE

... What about crane lifting capacities? How much over the side ... with and without outriggers? Any crane can pick up its maximum rated loads over the rear ... but what happens when you swing over the side with the load?

#### COMPARE

... What about boom weights and strengths? They take quite a beating, you know. Are they built sturdy and strong for extreme duty?

#### COMPARE

... How does the standard engine lug against full load? Is there plenty of reserve power?

#### COMPARE

... What are the swing cycles? They greatly affect production.

#### COMPARE

... Is the design clean-cut, simple, easy to get at and to service or adjust?

#### COMPARE

... Where is center of gravity? Does the machine sway and bounce when working? Or does it have that solid, stable feel?

#### COMPARE

... Are clutches hydraulically operated to provide smooth, easy operation, and to eliminate linkage wear?

#### COMPARE

... How many features are "standard" at no extra cost? How many are "extras" at a premium?

#### COMPARE

... How many choices of carrier mountings are available to fit your needs—your pocketbook?

#### COMPARE

... Who makes it? Who sells and services it? Are distributor men factory-trained? Are there nearby parts-on-the-shelf?

There are many more points to compare! It's your money! Know what you are getting for every dollar. Lorain-Dixie invites comparison with them all!

### IT'S YOUR MONEY—COMPARE WHEN YOU BUY

If you will really compare the Lorain-Dixie with any other machine in the 3/8-yd. class, you will be amazed at the values in this newest Lorain rubber-tire shovel-crane!

We do not claim the "Dixie" is better than all the others put together. No one shovel-crane could be made like that and be sold at the low Lorain-Dixie price. But, if you really compare the "Dixie" point for point, feature for feature, you will see why you get more for your dollar when a Lorain-Dixie goes to work for you.

For a quick review of important comparisons when buying any machine, check the list at left. But for the full facts, let your Thew-Lorain Distributor show you a Lorain-Dixie in person. See it...and compare... before you buy!

THE THEW SHOVEL CO., LORAIN, OHIO



For more facts, use Reader-Reply Card opposite page 18 and circle No. 411

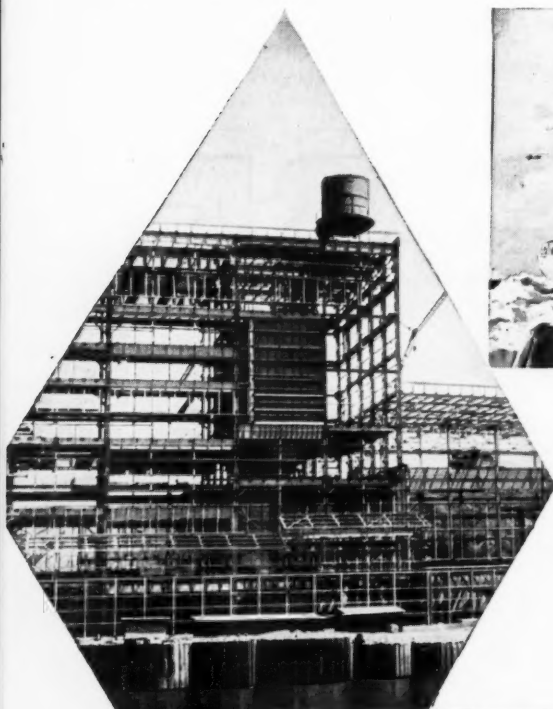
## Clark modification center and parts depot open

The Clark Equipment Co., Battle Creek, Mich., has opened a 40,000-square-foot plant in Richmond, Calif. The building will be used as a modification center and parts depot for the firm's industrial truck division.

Fabrication and installation of special attachments for fork-lift trucks, and completion of the assembly of lift trucks to equipment shipped from Battle Creek will be included in the plant's operations.



Down the Ohio River goes some of the \$1,250,000 shipment of earthmoving equipment to be used in grading the site of the new Olin-Mathieson plant near Carlington, Ohio. This was one of the biggest shipments of construction machinery in the area.



Ingalls-fabricated steel for new #8 unit at Alabama Power Co., Gorgas, Alabama



USS Glacier, world's largest icebreaker, lead ship in Navy expedition "Operation Deepfreeze"

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For steel erection . . . there is The Ingalls Steel Construction Company, which erects structural framework for buildings, power houses, tanks, bins and stacks.

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Sales Offices: New York, Chicago, Pittsburgh, Houston, Atlanta, New Orleans, Pascagoula.

### THE INGALLS IRON WORKS COMPANY

Sales Offices: New York, Chicago, Pittsburgh, Houston, Atlanta, New Orleans.

### THE INGALLS STEEL CONSTRUCTION COMPANY

Sales Offices: New York, Chicago, Pittsburgh, Houston, Atlanta, New Orleans.

## Big earthmover shipment barged to new plant site

Earthmoving equipment worth more than \$1,250,000—one of the largest shipments of construction machinery to pass through the Pittsburgh, Pa., area—is now in the hands of Allegheny Contracting Industries of Pittsburgh, Pa., contractor for the 10-million-yard grading job on the new Olin-Mathieson Chemical Co., aluminum plant near Carlington, Ohio.

The equipment, sent to the site of the proposed plant in four barge-loads, included ten Caterpillar DW21's and scrapers, three Caterpillar D8 tractors and No. 90 scrapers, a D8 with dozer, six D8's with dozers, a Link-Belt backhoe, two Buffalo-Springfield rollers, a jeep and a military-type truck. The towboat Allegheny handled the barges on the Ohio River. Units comprising the shipment were assembled at the river from central and western Pennsylvania and New Kensington, Pa.

## House gets multimillion highway-building bill

The long-hoped-for highway bill—calling for a total of \$51,860,000 to be spent in 13 years—has moved closer to being a reality.

The bill is now in the House, and it includes not only the authorization bill, but also a separate tax bill approved by the House Ways and Means Committee.

The authorization bill sponsored by Rep. George H. Fallon, (D.-Md.) calls for \$25 billion to be spent by the federal government, which will finance 90 per cent of the cost of constructing a 40,000-mile interstate road system. Under a gradually accelerated program, \$11,375,000,000 would be appropriated by Congress over 13 years, these bonds to be matched by the states.

To help the federal government meet its \$37,610,000,000 share of the total outlays, the new bill would increase taxes by \$14,814,000,000. This will be done under a 16-year tax plan, swelling federal revenues to an estimated \$38,498,000,000. Included in the tax increases will be a federal levy of 3 instead of 2 cents on a gallon of gasoline and other motor fuels. A tax on tires would be 8 instead of 5 cents, and excises on trucks, buses, and trailers would be hiked to 10 instead of 8 per cent of the price charged by the manufacturer.



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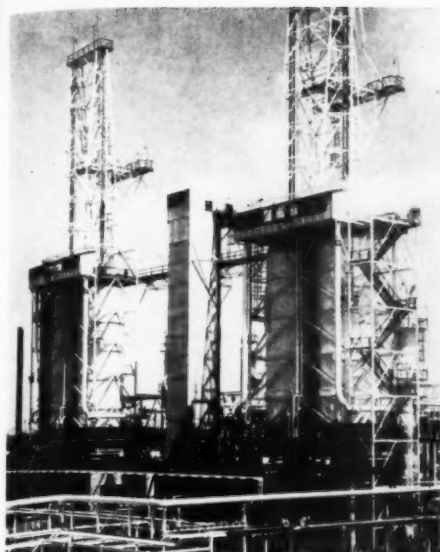
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NEERS



Instead of employing insulating material that had to be thrown away after one use, the Chicago Bridge & Iron Co. used and re-used the same mineral wool blankets for insulation during stress-relieving operations on these 75-foot-tall coke drums at a west coast refinery.

## Tough insulation eases stress-relief work

Stress-relieving operations requiring close temperature control—and made more difficult by the fact that Chicago Bridge & Iron Co., Chicago, Ill., was working with large field-fabricated structures—was accomplished during work on four 75-foot-tall coke drums by making a furnace of the structure itself.

Portable oil-fired burners, capable of delivering up to 40 million Btu per hour, fired directly into the vessel to bring it to critical temperature. Minerals wool blankets, made by Baldwin-Hill Co., Trenton, N. J., and Huntington, Ind., were re-used, to insulate all four drums. These blankets were secured to the exterior of the drums by 3/4-inch stainless steel bands, which were made of expander strap to allow for thermal expansion of the vessels. Asbestos paper, installed on the outside of the blankets and under the steel strapping, protected the insulation from rain and wind. During the work, the mineral wool blankets used were reinforced on one side by expanded metal lath and on the other by 1-inch wire mesh. Usually, when only one vessel is to be stress-relieved, low-cost mineral wool felt is used as the insulating material and thrown away after one use.

## Book on concrete road design and construction

A comprehensive volume on the design and building of concrete roads has been published by Her Majesty's Stationary Office, London, England. "Concrete Roads: Design and Construction" is divided into three sections, covering the properties of concrete, road design, and equipment and techniques used in construction. The book is a companion volume to "Soil Mechanics for Road Engineers".

Early chapters deal with ingredients of concrete, and mix design and control. Slab thickness, reinforcement, bases, joints, and prestressed roads are covered in the second section. The book can be obtained for \$4.50, plus postage, from the Department of Scientific and Industrial Research, Charles House, 5-11 Regent St., London S. W. I., England.

MAY, 1956

## New method saves money on building project

Close cooperation between the architect and engineer is resulting in maximum economy, better design, and better room layout in 50 Sutton Place South, a 20-story penthouse apartment building of reinforced concrete, recently completed by Fisher Brothers, New York, N. Y.

Problems of setbacks at the upper-floor level, and the support of pick-up columns were carefully worked out in reinforced concrete so that structural steel members, commonly used at such locations, could be eliminated. The special flat-plate beamless construction, developed by Farkas & Barron, the consulting engineering firm, was used throughout the building. This technique allowed columns to be stag-

gered so that they could be located in places where they offered a minimum of interference with room layout. Columns were spaced at a maximum of 19 feet 6 inches, and column dimensions varied from 14 to 18 inches at upper floors to an average of 20x26 inches at the first floor.

The 6 1/2-inch floor slab provides a flat unbroken ceiling.

Altogether, 5.7 pounds of reinforcing steel were used per square foot in the structure. This comes to a total of 1,016 tons as compared with the 2,600 tons that would have been required if a steel frame were used. A total of 11,000 cubic yards of high-strength concrete of 3,500 and 4,000-pound breaking strength was used.



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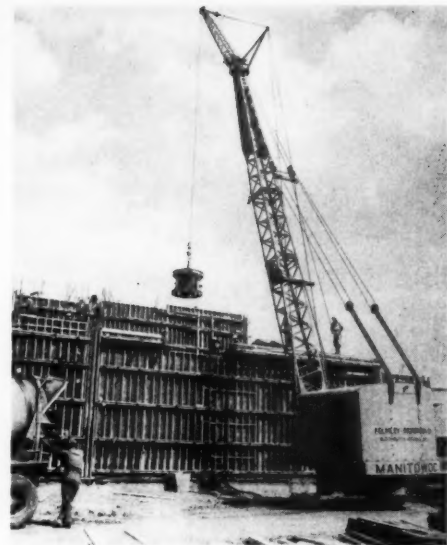
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177

Concrete for the forms is carried in this ¾-yard bucket by a Manitowoc 3000B Speedcrane. Made of ¾-inch plywood backed by 2 x 6 studs and double 2 x 6 wales, the prefabricated forms are tied with Universal Spi-Ro-Loc form ties. ▶  
C&E Staff Photos



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## Engine test cells built to absorb heat and noise

Construction of a group of buildings for testing powerful aircraft engines is a tricky job since the structures must absorb the thrust, noise, and heat generated by jet and cylinder-type military aircraft. But the fact that work continued throughout two winters made the construction of 32 of these aircraft-engine test cells at Chanute Air Force Base, Rantoul, Ill., just that much more complicated.

The \$8,642,000 contract between the Chicago District of the U. S. Army Corps of Engineers and Felmley-Dickerson Co., Bloomington, Ill., general contractor on the job, called for the construction of test cells with classrooms in addition to all the

necessary facilities for testing and observing the performance of engines. Auxiliary features also included in the contract are the central heating plant and distribution system, a training building, aviation-gas and jet-fuel storage facilities and distribution systems, a complete water-supply system, a sewage-treatment plant, roads, and an aircraft parking apron.

The project was started in May, 1954. By July, 1955, four cells for jet and cylinder-engine tests were turned over to the air force, and by November 18, 1955, an additional four of each type were completed. Four more units were finished by December 22, 1955, and the remainder by January

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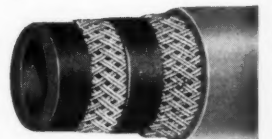
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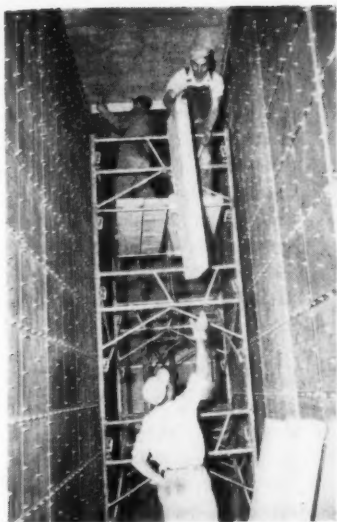
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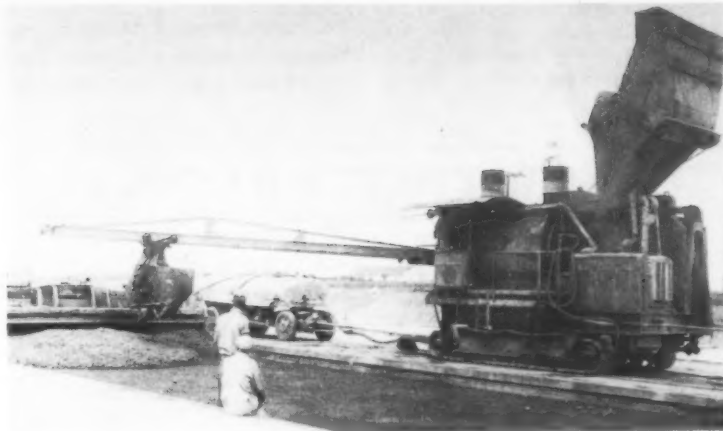
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CONTRACTORS AND ENGINEERS





In a cell which will be used to test jet engines, workmen install Fiberglas 4-inch thermal insulation to absorb the noise. The insulation will be covered with steel panels so that the deafening noise of the engines will not interfere with classes.



Paving of the parking aprons is handled by a Koehring Twinbatch 34-E paver. Riding on an already-poured strip, the paver discharges concrete in front of the Blaw-Knox spreader. Transverse and longitudinal finishers follow.

### Heavily insulated structures at Chanute AFB require special concrete work; job continues throughout two winters

27, 1956. Final seeding and site work brought the job to completion last month.

#### Two types of test cell

Each cylinder-engine test cell includes a room 175 feet long, 26 feet wide, and 26 feet high. Jet-engine test cells, measuring 110 x 19 feet, vary in ceiling height from 16 to 32 feet.


Walls and baffles are insulated with 4-inch Fiberglas insulation, the outer faces of which are covered with perforated stainless-steel covers. Jet engines to be tested are admitted to the cell through a large sound door, and

(Continued on next page)

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Working men and construction crews with thirst problems rely on IGLOO water coolers because they know its superior features. They'll tell you that its all-steel construction and corrugated to last longer, well supported at the bottom, has convenient rolled steel handles and comes in sizes from 2 to 15 gallons.

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MAY, 1956

## NEW! a cost-cutting drill for the push-button age!

### the JOY JUNIOR CHALLENGER

**BIG-DRILL FOOTAGE... LOWER LABOR COST... LESS TIME BETWEEN HOLES**

Our customers asked for a brute of a drill on a mobile, "push-button" carriage. In other words, they wanted more hole at less labor cost, shorter time between holes, and faster set-ups. Here's our answer: the self-propelled *Joy Junior Challenger*... the FIRST COMPLETELY POWER-OPERATED WAGON DRILL ever produced. It drills anywhere, in any position, in any formation. The operator has nothing much to do but think, and change steels. Here are a few of the reasons why the Junior Challenger will cut costs on your job:

**ALL POWER OPERATION**—All movements of feed, drill, and carriage are hydraulic or air-powered—no chuck wrench necessary.

**DRILLS AT ANY ANGLE**—Vertical bench hole, toe holes, horizontal holes, and angle holes both up and down from the horizontal.

**RIGID ALIGNMENT**—Feed is supported by two trunnions, will not vibrate or move out of line.

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**NEW HEAVY-DUTY 4½" DRIFTER**—Has features found on no competitive machine; drills up to 3½" holes to 40 ft. depth in any formation.

**SECTIONAL STEEL**—1¾" round steel system, sectional type with detachable striking bar, has ⅝" o.d. air tube for outstanding hole-cleaning ability.

Write for complete information to Joy Manufacturing Company, Oliver Building, Pittsburgh 22, Pa. In Canada: Joy Manufacturing Company (Canada) Limited, Galt, Ont.



#### SPECIFICATIONS

Easily drills up to 3½" holes to 40 ft. depth in any formation.

Drills horizontal holes to 7½ ft. height.

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FOR OVER HALF A CENTURY

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(Continued from preceding page)

observation rooms, classrooms, and equipment areas are arranged in two-

story units adjacent to the test cell. To permit normal conversation and classroom activities while engines are being tested, special acoustical treat-

ment of both engine rooms and classrooms was required.

Behind the engine-mounting platform in the test cell, a series of partitions and baffles, designed to absorb the noise and air blast from the engines, have been erected. Observation rooms and classrooms are air-conditioned, but special insulation and heat-resisting concrete were required to withstand the blast of the engines.

Concrete floors in these high-temperature areas, 4 inches or thicker, are made of slabs of heat-resistant aluminite concrete composed of aluminite cement and a special granite aggregate. Although the mix sets up quickly, it requires special measures to assure that finishing will be completed before the concrete hardens. Concrete was placed at tempera-

tures between 40 and 50 degrees F, with cement added to transit mixers on the site so that no time would be lost in transportation.

Under all building floors, a sub-grade of pit-run gravel, trucked in and spread to grade, was compacted to a density of 95 per cent Modified Proctor by Jackson vibratory compactors powered by a Jackson 2-kw generator. Two of the units were used singly and two others were combined into a double unit.

#### Forms insulated in winter

Because of the similarity of the structures, form panels were re-used many times. The panels, prefabricated in the carpenter shop from 3/4-inch plywood facing backed by 2x6 studs and double 2x6 wales, were handled in large units as they were moved by a crane and were systematically stripped and reassembled in proceeding from one test cell to the next. Forms were tied with Universal Spi-Ro-Loc ties and other Universal form hardware.

Concrete-placing operations continued throughout the two winters that the project was under way, with concrete pours being made on all but two days during the winter of 1954-55. To protect the concrete against cold, forms were insulated with 2 inches of Balsam wool applied between the studs. This insulation remained in place and was substantially undamaged by moving and re-using the forms.

After warm concrete had been placed and exposed areas had been carefully covered, heat was applied inside the structures. Even when the temperature dropped to minus-10 degrees, the minimum temperature of the concrete never went below 50 degrees.

Concrete was delivered to the job by Rantoul Ready-Mix Concrete Co. in transit mixers which discharged into 3/4-yard Jaeger concrete buckets. Hoisted to the forms by a Manitowoc 3000B Speedcrane equipped with a 65-foot boom and 15-foot jib, the bucket could reach all parts of the structures for direct pouring.

Special concrete mixes, including the concrete for the high-temperature floors and some lightweight mixes, were produced right on the job. Proportioned by a Winslow Binabatch, the materials were delivered to the skip of a Jaeger 16S mixer, where the concrete was picked up and taken to the point of placement by Gar-Bro motorized buggies.

#### Build aircraft parking apron

Construction of a concrete aircraft parking apron near the test cells was sublet to General Paving Co., Champaign, Ill. A LeTourneau Model D Tournapull and an Allis-Chalmers AD-4 motor grader did preliminary grading. A Koehring 34-E Twinbatch paver mixed concrete for the 15-inch apron slab and placed the mix in front of a Blaw-Knox spreader, which was followed by a Jaeger-Lakewood finisher and a Koehring longitudinal float. A Clipper saw was used to cut contraction joints.

In constructing a complete water-

## LOW-COST MOVING

Dual wheel, 10-ton, \$1125.00 including tires and platform, plus tax and freight.

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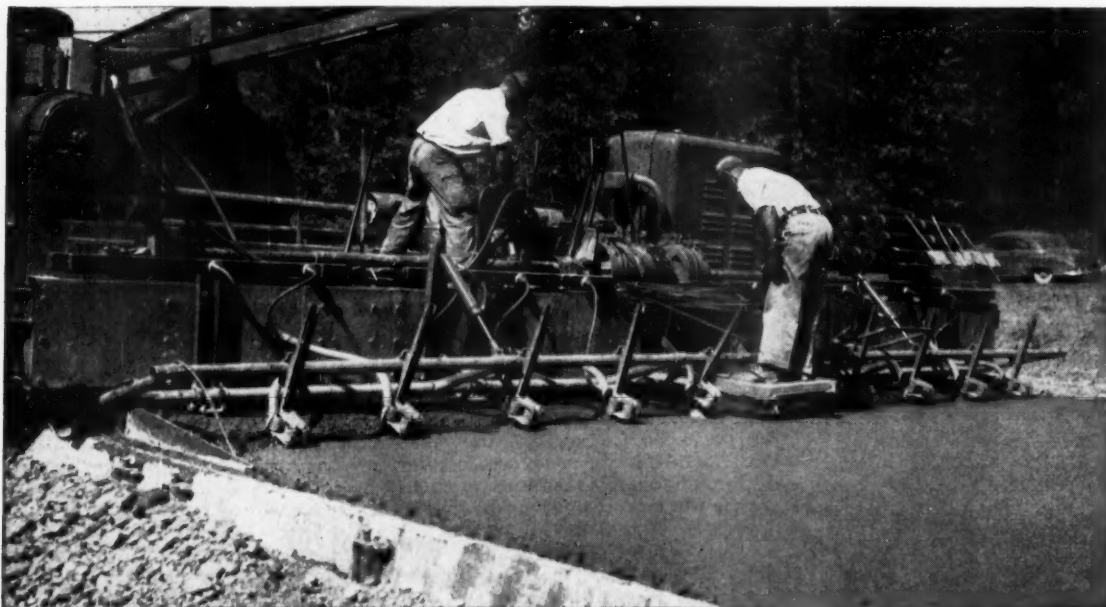
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## Now... uniform internal vibration improves full slab concrete quality—increases production 20% on airport and highway paving jobs!

Maginniss Hi-lectric internal full slab vibrators operate completely immersed below concrete surface—provide uniform vibration throughout the slab. This uniform internal vibration assures a homogeneous mixture of aggregate and mortar from base to surface of slab—produces better concrete. And, actual internal vibration with Hi-lectrics speeds concrete distribution—leaves surface semi-finished—cuts finishing time—increases pavement production!

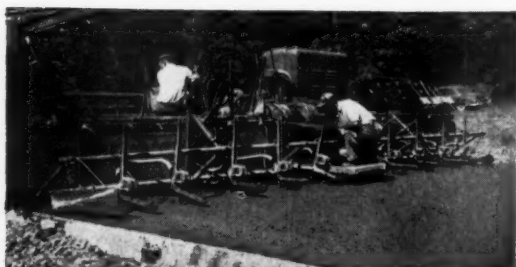
On a recent highway paving job, use of Maginniss internal full slab vibrators enabled the contractor to eliminate the second pass of the finisher—increased daily paving production 20%

over that obtained with the vibrator formerly used!

The lightweight Hi-lectric attachment mounts directly on the spreader or finisher—requires no auxiliary carriage. Machine operator controls vibrator position, operation and frequency to suit consistency of concrete and other job conditions. Slabs up to 25 ft. wide and from 4 to 19 in. deep can be vibrated efficiently and economically.

Find out how *uniform internal vibration* can improve concrete quality, speed production, and cut costs on your airport or highway paving jobs. For full information, call your nearest Maginniss distributor. He's listed in the Yellow Pages under "Concrete Vibrators."

AA-2958



Uniform vibration of this 24 ft. x 9 in. highway pavement slab was provided by 10 Maginniss motor-in-head vibrators spaced 28 in. apart. Center dowels were accurately positioned at proper depth by dropping them ahead of two center vibrators.

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INEERS

supply system, two gravel-packed wells were driven to a depth of 285 feet. The 12-inch wells produce 1,000 gpm which is pumped to a 300,000-gallon elevated storage tank 158 feet high. The water system includes a complete network of mains serving all of the buildings and supplying fire hydrants strategically located throughout the site. Much of the trenching for the underground utilities was handled by an Insley backhoe, and an Allis-Chalmers HD-5 tractor-dozzer handled the backfill.

#### Personnel

General supervision of the project for Felmley-Dickerson Co. was handled by project manager James B. Meek. Ray Dickerson, vice president of the firm, also spent a great deal of time at the job. Harry Edbrook, Jr., was superintendent in charge of the jet-engine test cells and general mechanical work, and Ed Maliskis supervised construction of the cylinder-engine test cells. Tom Kelly was superintendent for General Paving Co. on the apron-paving operation.

For the Chicago District of the U. S. Army Corps of Engineers, Hugo Schneider was resident engineer on the project. Col. Philip F. Kromer, Jr., is the district engineer.

THE END

#### Reimbursement amendment would pay states for roads

New York and other states that went ahead and constructed roads that will form part of an interstate highway network to be built and maintained with federal aid may—or may not—be reimbursed for the work. New York has been trying to get back some \$650 million from the federal government as compensation for building the billion-dollar Thruway.

The House Public Works Committee approved the principle of reimbursement as an amendment to the \$52 billion road bill now in committee. Just previous to this, it turned down a provision that would have allocated \$25 billion of the proposed road money for refunds as well as new roads.

Before any reimbursement is made, however, the Secretary of Commerce will make a two-year study of the problem to determine terms and conditions of the refunds, submitting his recommendations to Congress. His report is not due until January, 1958. And since one Congress cannot bind another, and the new Congress meeting in 1958 may have a very different political complexion than the present one, the issue of reimbursement for construction already done by states is—for all practical purposes—still hanging fire.

#### L. B. Foster fills post

L. B. Foster Co., Pittsburgh, Pa., has made Stanley Kapp general superintendent of plant facilities, with headquarters in Chicago. Kapp has been with the firm for 23 years as superintendent of Foster's Chicago plant.

#### Handbook on procedures for safety in quarries

A new handbook designed to promote safety in the quarry industry has been released by the American Standards Association, Inc., New York, N. Y. Entitled "Safety Procedures for Quarries", the book is based on "Safety in Quarry Operations", a release of the National Safety Council.

The new American Standard work incorporates those systems of safety advanced by the National Safety Council and features an enlarged section on safety procedures with explosives and precautions used in the operation of trucks.

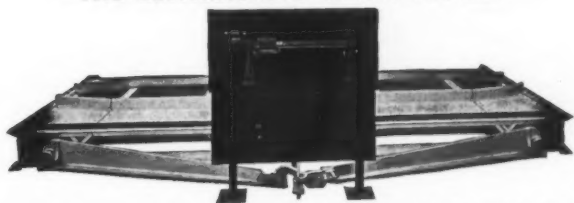
Standards are also given for drilling, using electrical equipment, load-

ing, conveying, fire prevention, and sanitation.

The appendix gives data on establishing and using first-aid facilities.

Priced at \$1.50, the book is available from the American Standards Association, 70 E. 45th St., New York 17, N. Y.

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designed for close control with heavy loads



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**An expanded highway program**



Paul B. Reinhold, qualified to cover some of the more important aspects of the nation's highway problem, is a former president of the American Road Builders' Association and president of Atlas Equipment Corp., Pittsburgh, Pa.

It is impossible to cover all aspects of the nation's highway problem in a short time; it is also impossible to understand the fuss being raised in Washington and elsewhere about a highway program. Magazine and newspaper articles and editorials are telling the true highway story. I am one who is sold on the fact that the American public is fully conscious of our present need.

Our highway system is hazardous. It is obsolete, congested, and totally inadequate to handle our present highway transportation requirement, let alone the constant increase in this requirement.

Though I cannot cover all the different facets of this problem in a

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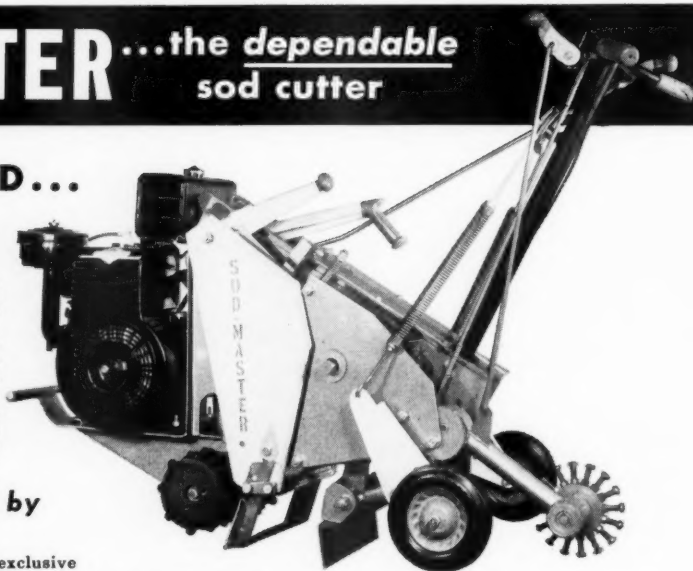
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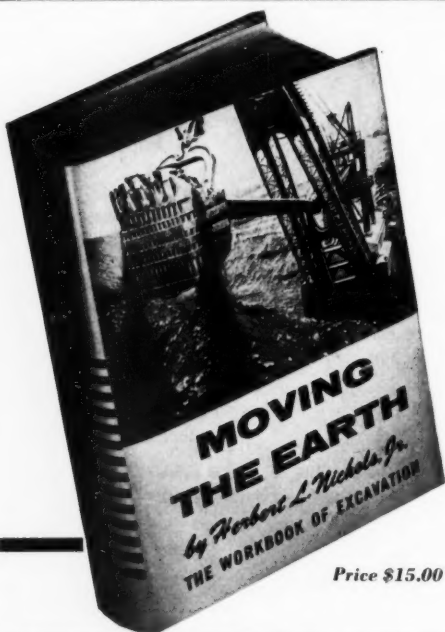
**One man cuts up to 1000 sq. yards per hour with ease!**



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**CONTRACTORS AND ENGINEERS**



by **PAUL B. REINHOLD**, president,  
Atlas Equipment Corp., Pittsburgh, Pa.

short space, I will try to spotlight a few.

The Fallon bill, one of a number of highway bills currently in Congress, covers the construction or reconstruction of what is known as the Interstate System, 40,000 miles of road, during the next 13 years at a cost of about \$27 billion. These 40,000 miles would connect every state in the union and all but six of the 48 state capitols. They would also connect 90 per cent of all cities with a population of more than 50,000.

#### Present situation

At present, 51 million passenger cars, 10 million trucks, and about 250,000 buses make up a total of 61½ million vehicles using our highways, and I have been on the road many times when I was sure all the garages in the nation were empty.

Another element that enters the highway picture, an element that is many times overlooked, is the current activity in the automotive industry. In 1955, a total of 9,643,000 vehicles were produced in the United States and Canada. This is 40 per cent higher than in 1954, and 16 per cent higher than any previous annual record.

Naturally, the question arises: are we building our highways to keep pace with this terrific production? We know perfectly well we are not. Yet, based on present automotive production records, we will have at least 81 to 82 million vehicles using our road system by 1966.

One of two things must happen. We must either get busy on our highway-

building program and have it adequate to absorb this constantly increasing influx of vehicles, or cut back production at automotive plants. The latter would certainly be a disastrous proposal. Production of steel aluminum, plate glass, paints, and many other products would be affected.

It is imperative that we start work on our highway program as soon as possible. Building roads is not push-button work. For the moment, let's imagine that billions of dollars could suddenly be dumped into the highway departments of the several states. That does not mean that the money could be spent immediately and roads built in a few months. We must not overlook the fact that highways, and especially bridges, require that a considerable length of time be spent in preparatory work. Location surveys, property damage, plans, and specifications have to be considered, and in many cases it requires one and a half to two years after the project is released before bids can be taken.

Even if money should be readily available, there would be a time lag in constructing needed roadways and facilities. These postponements are expensive. Meanwhile, according to an estimate by the U. S. Bureau of Public Roads in Washington, our inadequate and inefficient highway-transportation system at this moment is costing the country about \$5½ billion dollars per year.

#### Urging Federal action

The situation is one which has never been given the attention it de-

served by the Federal government, which year after year has been collecting over \$2 billion in excise taxes from the highway user. Never have we had returned, in federal aid for highways, as much as 25 per cent in any one year. Every two years, when each new Congress convened, it was necessary to do battle with Congress to get even a small percentage of money for highway construction. The only possible way out of our present highway difficulty is through federal

action. And that action must come quickly.

The question naturally arises: What can I do about the situation? One of the things you can do is to write, or wire your Senators and Congressmen, and appraise them of your feelings and ideas. Impress upon them the seriousness of the situation, urge them to help get the road program passed in this session of Congress.

Bringing the problem down to a  
(Concluded on next page)

## for HEAVY hauling



Truck powered by Waukesha WAKR (Butane).

## WAUKESHA

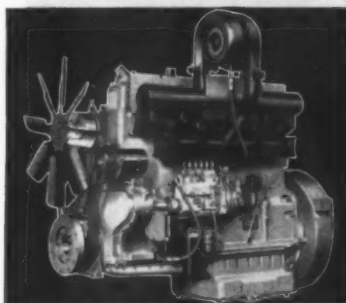
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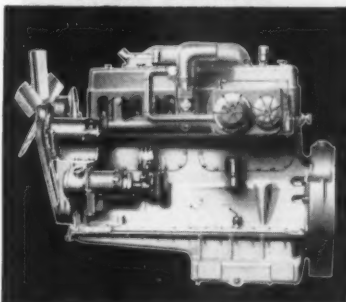
UP TO 352  
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#### WAKDBS TURBODIESEL



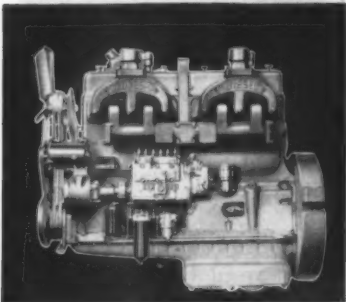
WAKDBS Turbocharged Diesel—six cylinders, 6¼-in. bore x 6½-in. stroke, 1197 cu. in. displacement, 352 hp at 1800 rpm.

#### WAKR BUTANE



WAKR Butane—six cylinders, 6¼-in. bore x 6½-in. stroke, 1197 cu. in. displacement, 290 hp at 1800 rpm.

#### WAKDB NORMAL DIESEL



WAKDB Normal Diesel—six cylinders, 6¼-in. bore x 6½-in. stroke, 1197 cu. in. displacement, 258 hp at 1800 rpm.

Send for descriptive bulletins

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312



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loads in less than 2 min.

destination: next job

drive right up on it

carries 10 tons

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\* Miller "BT" 10 ton Tandem axle  
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Gives Complete Protection  
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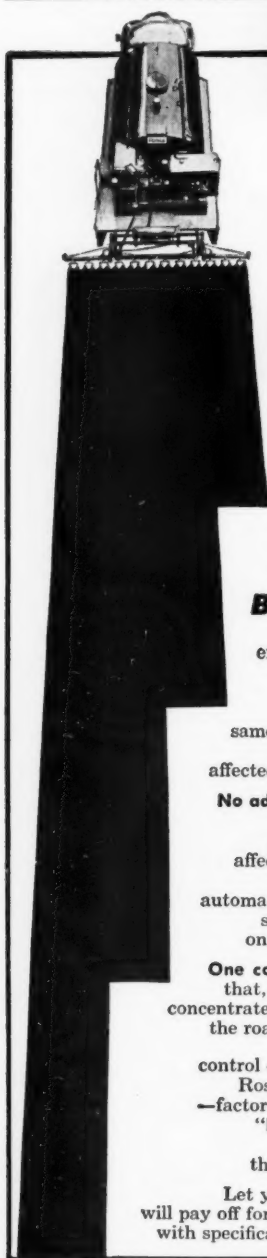
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## ROSCO'S PRESSURE METERING MAKES THE DIFFERENCE AT ANY WIDTH!

### Do you know...

that it's possible to apply bitumen through any length of spraybar from 1 to 24 feet without changing the pressure and without any application adjustment? It can be done with a Rosco! You would normally expect surges or drops in pressure to occur when sections of a distributor's spraybar are shut-off or turned on.

### But...

NOT with a Rosco Distributor equipped with exclusive Pressure Metering. Even when as much as 23 feet of a 24-foot spraybar are shut-off, the precise, accurate delivery remains unaffected... the pressure in the working one foot stays the same as it was pre-set at the beginning of the run. The accurate delivery from the working nozzles is not affected... no matter how many feet of the bar are cut out.

No adjustments in truck or pump speed are required—in fact, with Pressure Metering the pump speed never changes and normal wear of the pump never affects the accuracy of the application. When any part of the spraybar is shut off, the excess material is automatically by-passed. Pressure at the operating nozzles stays the same. When additional nozzles are turned on, pressure is immediately available to supply them.

One control sets the pressure specified for the job. After that, pressure control is automatic... the operator can concentrate full attention to spotting the material properly on the road. Pressure Metering is an integral part of Rosco's patented Master Valve that permits one-lever control of all normal distributor functions. You'll find that Rosco's Pressure Metering is faster and more accurate—factors which can be the difference between a "make" or "break" job in today's highly competitive field. And Rosco's Pressure Metering assures you of jobs that will always meet rigid application specifications.

Let your Rosco dealer show you how Pressure Metering will pay off for you. Or write the factory for descriptive literature with specifications on Pressure Metering-equipped Distributors.



ROSCO BITUMINOUS DISTRIBUTOR with Pressure Metering. Front or rear mounted for truck or trailer.

**Rosco**  
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DISTRIBUTORS • MAINTAINERS • BROOMS  
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(Continued from preceding page)

local level, we can find just what has been, and what is being done in the field of highway construction. The Penn Lincoln Parkway provides a good example. The job is about 20 miles long. When it is completed, it will have cost about \$150 million. That is an average of \$7½ million per mile. Such a job provides ample proof that officials are making every effort to build modern highways. It also provides ample proof that modern highways cost a whale of a lot of money.

Though the \$27 billion which the Fallon bill would provide for highways sounds like a huge sum, it will not be enough to cover work on our highways. The deficiency for all highways in the 48 states comes closer to about \$125 billion.

### Willingness to pay

Highway users are willing to pay for highways. This can be illustrated over and over again on the local level. The toll of the Pennsylvania Turnpike averages 1.09 cents per mile. Assuming a passenger car travels 15 miles to a gallon of gas, then converting the mileage cost into cents per gallon, this would amount to a 16½-cent gas tax. Add this to our federal and state tax of 7 cents, and we have a total gas tax of 23½ cents per gallon.

The 5-mile-long Chesapeake Bay bridge has a toll of \$1.75. Again assuming 15 miles to the gallon, the toll could be figured as 52½ cents tax. Add the usual 7 cent tax, and we find that a gasoline tax of 59½ cents had been paid just to ride five miles.

These facilities were badly needed, however, and we find that people are willing to pay for the convenience of using the bridge and pike. In 1953, more than 11,600,000 vehicles used the turnpike, and revenue came to about \$22 million. In 1954, 12,700,000 vehicles passed over the turnpike, bringing in a revenue in excess of \$22 million. Last year, a little more than 17 million vehicles used the turnpike and revenue came to approximately \$27 million.

It is clear that the public does not care who builds highways, the Republicans of Maine or the Democrats of New Mexico. The public cares only that highways be built, and as soon as possible.

THE END

From a recent address made before a highway users' meeting in Pennsylvania.

### Alcoa plans new plant

An \$80 million smelting plant is scheduled to be built near Evansville, Ind., on the Ohio River, by Aluminum Co. of America, Pittsburgh, Pa.

This, Alcoa's eighth aluminum smelter, will raise the company's installed primary capacity to 942,000 tons per year.

The 150,000-ton smelting plant is scheduled to go into production in the fall of 1957. Eventually, 1,200 persons will be employed at the facility, and the payroll will come to \$5 million annually.

### Corps of Engineers names Chicago district engineer

Col. John B. W. Corey, Jr., has been appointed district engineer for the U. S. Army Corps of Engineers at Chicago, succeeding Col. Philip F. Kromer, Jr. Col. Kromer has been assigned to duty in Japan.

Col. Corey, who will take up his new duties July 16, is a civil engineering graduate of the University of Washington. A reserve officer since 1934, he was commissioned in the regular Army in 1938, and during World War II, served in Alaska and the southwest Pacific. He served at Fort Belvoir, Va., for a year before attending Texas A & M College, where he received his master's degree in civil engineering.



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## Disagree on method to save tower of Pisa

The leaning tower of Pisa may be leaning only one way, but those interested in keeping it from falling are leaning in two directions.

Right now, the 184-foot campanile is 17.15 feet out of plumb, and the rate of the lean is increasing 0.027 inches from the vertical every year. The first indication that the tower might collapse came in 1940, when water appeared between the stones of the foundation. Concrete was used to strengthen the structure, but six years later, when the Arno River overflowed, the tower began tilting more and more and nothing that has been done since then has been able to arrest the movement. If

something is not done soon, say some experts, the famous tower will fall within the next 50 years.

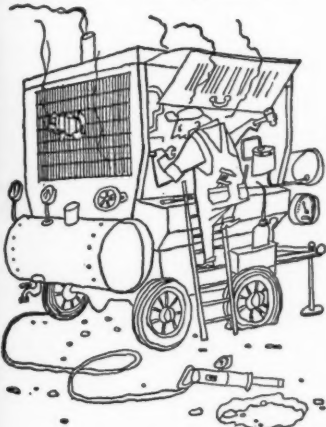
The only way to save the tower, according to a University of Rome professor, is to dismantle the structure, build a concrete foundation, then rebuild the tower with the same materials.

But there is a better way to do the job, according to Spencer, White, & Prentis, Inc., New York, N. Y., the firm that removed big columns from the Copacabana, a basement night club in a multistory New York building. (See page 146.)

The method had previously been suggested by the late president of the firm, Charles B. Spencer. It would involve exerting a force against the low side of the tower and a pull from the high side, while vertical support under the foundation of the low side would be increased and a part of the foundation support on the high side removed.

Take your pick.

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For more facts, circle No. 433  
MAY, 1956

## Excavation nears end on St. Lawrence locks

Excavation for the two large locks in the U. S. section of the St. Lawrence Seaway is virtually complete, and preparations are now underway at the site for the construction of the locks, which will cost a total of \$50 million.

Since work started a year ago, more than 2,442,000 cubic yards of material have been removed from the site of the Robinson Bay lock and more than 2,818,000 cubic yards for the lock at the Grasse River site. While this work was going on, more than 1,082,000 yards of embankment material was placed for the Robinson Bay lock and more than 287,000 yards for the Grasse River lock.

## Esso plans expansion of Cuban facility

A complete modernization and expansion of Esso Standard Oil's Belot refinery in Havana, Cuba, is scheduled to be done by Arthur G. McKee & Co., Cleveland, Ohio. The firm will work with Raymond Concrete Pile Co., New York, N. Y., in a joint-venture relationship, though the McKee firm will have full responsibility for the project.

## Texas organizations elect

New officers have been elected by two Texas organizations—the Texas Aggregates Association and the Texas Ready Mixed Concrete Association.

Heading the Aggregates Association is G. O. Rogers of the Travis Materials Inc., Austin; Allan Cunningham of F. M. Reeves & Sons, Inc., Pecos, is vice president; and John Van Amburgh, Wesco Materials Corp., Dallas, secretary-treasurer.

The Texas Ready Mixed Concrete Association has elected Weaver Cunningham, West Texas Products Inc., Odessa, president; James B. Bumgardner, North Side Ready Mix Concrete Co., Houston, first vice president; and Floyd J. Childs, Childs Ready Mix Concrete, Abilene, second vice president.



"Whew! . . . I thought it was an Indian attack."

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JACKSON SIDE FORM VIBRATOR

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Jackson Multiple Vibratory Compactor

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The JACKSON MULTIPLE COMPACTOR has now thoroughly demonstrated that it is by far the most advantageous equipment for achieving or exceeding specified densities in rock, slag, sand, gravel . . . all granular soils used in waterbound and penetration macadam construction, and in filling the voids in rock and slag courses with fines. The Jackson does it in about half the time required with other types of equipment. It is equally efficient for consolidating large granular soil fills such as bridge approaches and kindred projects.

### JACKSON INTERNAL TYPE PAVING TUBE

Supplied with extraordinarily powerful motors, no concrete highway or airport paving job is too tough for this improved machine. Tubes vibrate deep in concrete, quickly plasticizing harsh dry mixes in slabs to 24" thick and as wide as 25'. It saves time, saves cement; provides greater density and compressive strength. Cuts spreading costs where no spreader is used. The tube is made up of one unit as shown for each 5'-0" (maximum) of slab width. Usually attached to front of finisher and controlled by finisher operator. Power is supplied by a Jackson Power Plant mounted on the parent equipment. Use of a JACKSON Side Form Vibrator on standard finisher assures thorough consolidation and plasticity of concrete at side and center forms — with no "missed" spots. Labor savings effected quickly repay cost of equipment.

### MUNICIPAL PAVING — BRIDGE DECKS, ETC.

For jobs of this type a JACKSON Vibratory Screed and Portable Power Plant is the most convenient, productive and inexpensive outfit you'll find anywhere. Strikes off to any crown, undercuts at curb and sideform, works right up to and around all obstructions. Two men easily handle it on all slabs up to 30 feet wide, and it may be rolled back for second passes on 4 rollers.

### PORTABLE POWER:

Thoroughly reliable, time-proved plants in capacities of 1.5 to 7.5 KVA . . . equipped with permanent magnet generators requiring no maintenance or adjustment. They provide both single and 3-phase 120V., 60 Cy., AC and may be used for lights as well as operating all JACKSON equipment.

**FOR SALE OR RENT AT YOUR JACKSON DISTRIBUTOR**

**JACKSON VIBRATORS, INC.**  
LUDINGTON MICHIGAN

For more facts, use Reader-Reply Card opposite page 18 and circle No. 434



## The weather outlook for June

The two accompanying maps indicate the average weather conditions that might be expected throughout the United States during the month of June, with respect to the number of days with rainfall and the number of days with temperatures of 90 degrees or higher.

In Chart I, those areas indicated as dry will average fewer than four days of rainfall during the month. Medium areas will probably have between four and ten rainy days, while wet regions will have over 10 days of rainfall.

Warm areas indicated on Chart II might expect an average of more than ten days when the maximum temperature will reach 90 degrees or higher; medium areas will average between two and ten above-90 days, and cool areas may expect fewer than two such hot days. Florida, for instance, is indicated as warm in spite of the

one 90-degree day expected at the southern tip. The ten 90-degree days predicted for the northern part of the state, will bring mean temperatures for the month into the 80's.

The charts may also be used in a relative sense, in that they reveal more rainy days can be anticipated in Chicago, Ill., than in Kansas City, Mo., or New York, N. Y. At the same time they show that Nashville, Tenn., will be drier than Bismark, N. Dak.

Prepared for CONTRACTORS AND ENGINEERS by Weather Corp. of America, 39 Broadway, New York, N. Y., and 611 Olive St., St. Louis, Mo., these charts are indications of average conditions and are not intended to be specific forecasts. However, Weather Corp. of America will answer any specific questions regarding the use of the charts or on applied uses of climatology.

THE END

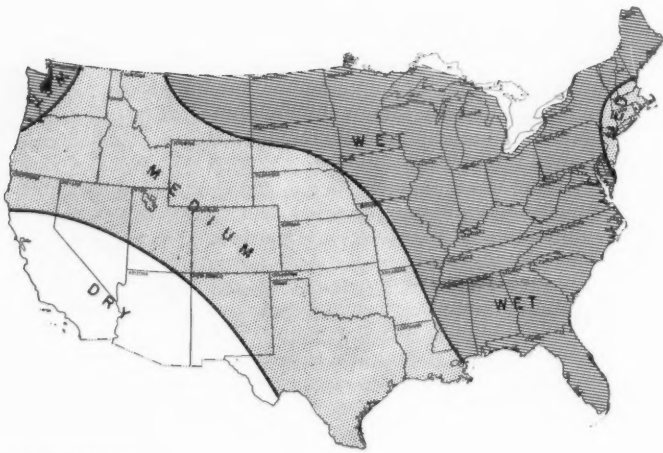


Chart I: Precipitation

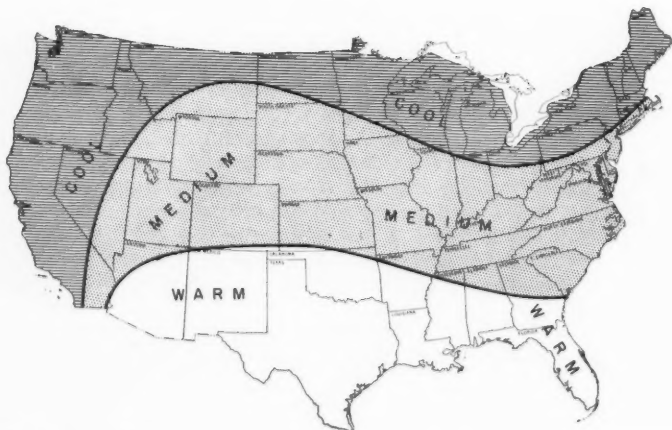


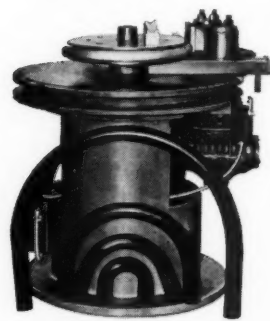
Chart II: Temperature

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## Rapid transit becomes issue on Narrows bridge

Now that the \$220 million Narrows Bridge between Staten Island and Brooklyn, N. Y., received a go-ahead sign, one of the first squabbles has arisen about the proposed facility.

The hassle has those advocating a rapid-transit system on the span pitted against those who do not want tracks to be carried across the Narrows. In the latter camp is Robert Moses, chairman of the Triborough Bridge and Tunnel Authority, the agency in charge of construction.

According to Moses, the disadvantages of building the bridge to accommodate a rapid-transit line are evident and overwhelming. First of all, the bridge will be a toll facility and it must be self-supporting, since the authority has no taxing power. Operating a rapid-transit line would add to the cost of the bridge and, since this would be a deficit operation, bonds to finance the span might be difficult to sell.

Moses also pointed out that the Staten Island rapid-transit system is already in financial difficulty. If operating costs were to be met, fares on such a line from Brooklyn to Staten Island would be so high that the line might not attract enough passengers. And if the line were built, said Moses, it would entail construction of stations, yards, and other facilities in downtown Brooklyn, as well as a tunnel and connections to Manhattan. This would cost about a billion dollars. Moses feels that the problem of urban rail transportation cannot be solved by asking motorists to make up the deficit created by a rapid-transit system.

Opposing Moses are those who feel that a rapid-transit system, linking Staten Island, Brooklyn, and eventually Manhattan, is vital if Staten Island is to be developed. The feeling is that the Narrows span should be built to accommodate a rapid-transit line in the future. While not denying that Staten Island's rapid-transit system is operating at a deficit, they point out that if the line had connections to Brooklyn and Manhattan, it might be operated economically.

## Col. O. J. Pickard named Norfolk District engineer

The new district engineer for the U. S. Army Corps of Engineers at Norfolk, Va., will be Col. Oliver J. Pickard. He will succeed Col. Robert B. Warren in the post, effective July 23.

Col. Pickard, a graduate of the U. S. Military Academy at West Point, holds a civil engineering degree from the Massachusetts Institute of Technology. He served in the southwest Pacific during World War II, and from 1945 to 1950, was at the Engineer Training Center and The Engineer School at Fort Belvoir, Va. He was later in charge of the Army Engineer area office in Denver, Colo., before being assigned to the 6th Armored Division, Fort Leonard Wood, Mo. At present he is vice-commander of the 7th Engineer Aviation Brigade, U. S. Air Force, in Europe.

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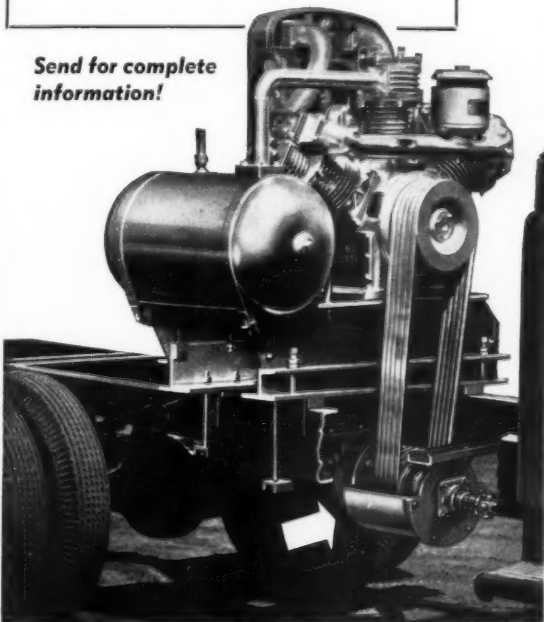
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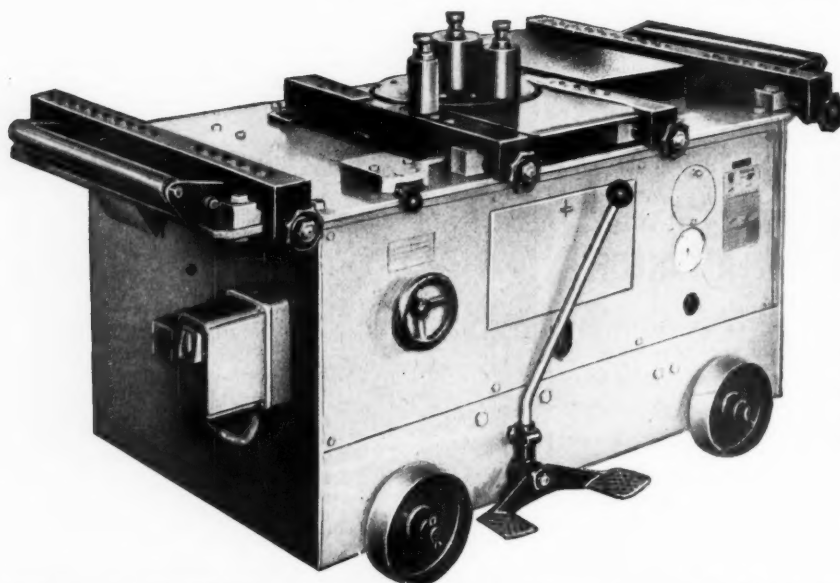
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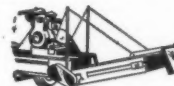
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**HANDLE MANY JOBS WITH THESE ATTACHMENTS**



**Strike-off Box Attachment.** For road widening fill and asphalt paving. Adjustable on three sides to 6" above grade. Strike-off blade extends 4'. Remove with one pin.



**Conveyor Extension Attachment** permits backfilling 24" high curb or placing material over 7' from wheels. Take-off drive. Unit is 4' long with independent belt.

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**Performance proved!** Everywhere POWER-PACK has been used great savings result in labor and time... also you can expect a better fill with no material wasted! Only one man operating the POWER-PACK can power-backfill curbing, trenches, and pipelines at the rate of three tons per minute! This equipment has actually paid for itself on a single job. Ruggedly built for long service. Easily portable with four swivel wheels and a sure, quick hitch. Can be used with any size dump truck including trailer dumps. Dependable 8.25 Wisconsin engine. Heavy duty belt.

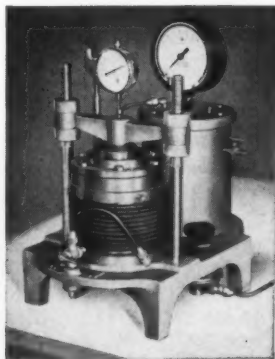
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- Instantaneous load application
- Compact—less than 1 1/2 sq. ft. of table space
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Use this kit to cut downtime • speed repair and salvage • reduce component inventories



Heli-Coil® Shop-packs provide a new method for on-the-spot, permanent repair of damaged threads. It's as easy as this...

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Heli-Coil Inserts are made of diamond-shaped, coiled, stainless steel wire. They eliminate plugging, welding, going to larger bolts or studs. Many maintenance men install Heli-Coil Inserts at wear points on new equipment during first overhaul to prevent expensive downtime later.

Your distributor can supply you with handy Shop-pack Kits for repairing thread sizes 6-32 to 1 1/2-6 NC and 6-40 to 1/2-20 NF. (Available also for 14 mm spark plug threads.)

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After an inactive first half in Congress, lawmakers are going to have to settle down to business to push essential legislation through by July. When they came back from their mid-term vacations, most of the work still staring them in the face involved construction authorizations of one kind or another.

Many congressmen would probably trade their law degrees for engineering or cost accounting experience these days, as they worry over plans for new roads, dams, flood control projects, military bases, schools, and hospitals. They are handling sizeable

sums, and any mistakes they make this year are going to be costly ones.

First on the agenda on the House side was the big military construction bill. As reported by the House Armed Services Committee, it authorized spending during fiscal 1957 of more than \$2,156,000. Of this amount \$304 million was slated for the Army, \$401 million for the Navy, and \$1,137 million for the Air Force.

This money is for projects all over the world, including those in U. S. territories, Japan, Germany, Cuba, Okinawa, and Italy. Authorizations also cover work in 47 states and the

District of Columbia.

As might be expected in a bill of this scope, the provisions defy classification. In general, Army spending will be mainly for expansion and improvement of NIKE defense of key cities, bases and industrial centers. A minor share—\$22.1 million—will go for troop and family housing.

More than 50 per cent of the Navy authorization is earmarked for air facilities, including \$94 million for fleet support air stations. A new \$10 million station will be built at Le-moore, Calif., and a \$6 million jet sea-plane base will take shape at Harvey

Point, N. C. The rest of the Navy money will go for additional service schools, and supply, communication, and medical facilities.

The one billion dollar Air Force slice, the largest for any branch of the armed services, will cover operations and training facilities on a number of already existing Air Defense Command bases and one new installation in Portland, Oreg. Spending for the Strategic Air Command will total \$93 million in 38 different locations. A big share of this amount will go for additional airfield pavements.

For the first time in a major military construction bill, House lawmakers recommended the use of the modular, or 4-inch, measure in the design of family and other mass housing. The Committee wants the module used wherever feasible and practical.

The House bill was expected to pass promptly, with few amendments. On the Senate side, hearings on a similar bill are still in progress. When the measure reaches its final form as a public law, it will be worth study by every builder interested in military construction contracts.

Despite all obstacles, the most informed Capitol observers think the highway bill will stumble through Congress this year. Now, the steady pressure on lawmakers for action is on the increase. But the highway bill still has a tough road ahead of it, as evidenced by some parliamentary problems:

The Senate Public Works Committee was a little confused about what it would do when the highway bill finally passed the House. Since the plan was to combine the Boggs financing bill and the Fallon authorization measure into one package, it looked as if the Senate would have to tear them apart again.

The Senate, of course, passed its own authorization measure, the Gore bill, last year, but it never voted on a financing plan. That will have to go through the Senate Finance Committee before it goes to the floor. It is possible that the authorization differences, which are sizeable, can be settled in a House-Senate conference.

Action is more direct on another highway measure. The Senate Public Works Committee favorably reported a bill to increase emergency relief highway funds from \$10 million to \$30 million. The money, to be used by the end of next month, is needed to reconstruct highways and bridges damaged by this year's floods and hurricanes. Major damage areas were in the northeast and far west.

Scheduled to follow final action on the highway bill in the House committee is consideration of an omnibus flood control bill. Scores of separate flood control measures have been introduced this year, but so far, the U. S. Army Corps of Engineers has reported on only a few of them. Con-

Built in '24  
Rebuilt since...  
Still has  
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One of  
16 Allied  
Etnyres in  
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during '55



### Ease and accuracy of Etnyre operation help Allied Bitumens break-in "green" men

What a testimonial! Allied Bitumens, Inc. of Buffalo, New York, was organized twenty years ago. In 1938 the firm purchased three used "Black-Toppers" which had been built originally in 1924 and 1925. Each of these 30-year-old Etnyres has been rebuilt, but the tanks are original... and they have never leaked!

According to C. W. Allemeier, Secretary of Allied: "This long life, excellent service, and low upkeep are important reasons why we continue to buy Etnyres." Including two new Etnyres delivered in 1955, the Allied fleet now

consists of sixteen "Black-Toppers."

As Mr. Allemeier points out, his is a seasonal business, requiring the annual break-in of many new drivers. This problem is simplified by the ease and accuracy of Etnyre operation.

With experience like this to guide you, why put up with anything but the very best in distributing equipment? Contractors everywhere agree that you'll turn out better jobs, in less time, at lower cost with Etnyres. Get all the facts—see your nearby Etnyre Dealer, or write E. D. Etnyre & Co., Oregon, Illinois, U.S.A.

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gressmen plan to study all bills on which favorable reports are received.

Local pressures from flood-damaged districts, particularly in an election year, could easily turn this important legislation into a patchwork of stop-gap measures. And warnings from weather experts that the new hurricane pattern may be here to stay, may cause congressmen to let panic influence their judgment.

This may be a big year for Colorado. The \$760 million Senate measure authorizing several Colorado River power and reclamation projects went to the President for signing last month. In conference committee, senators agreed to House changes, including deletion of the Echo Park Dam, and the bill slipped through in two days.

The second big Colorado bill is the one authorizing the Fryingpan-Arkansas project, which would bring water from the Colorado River Basin to the Arkansas River Basin on the opposite side of the Continental Divide. This would furnish a partial supply of water to about 322,000 acres of land, increase the water supply of Colorado Springs, Pueblo, and other towns, and generate about 470 million kilowatt hours of electric energy each year.

A system of conduits on the western slope of the Divide would collect the runoff from melting snow and deliver the waters to the western portal of a 6-mile tunnel beneath the Divide. On the other side of the tunnel, the waters would flow into a tributary of the Arkansas. Included in the project are several reservoirs and a number of power plants.

This second project is an ambitious one, but it may not have smooth sailing in Congress. In spite of favorable reports of both House and Senate committees, there are some minor differences in the versions of the bill that may cause trouble. There is also a feeling in some House quarters that Colorado has had enough attention.

Even if the project is approved, no one has any idea when construction might begin. Some think action will be delayed until there is a temporary lull in construction activity. Then some of these big jobs could be started to tide the industry over.

Senators were split three ways in their report on Niagara River power development. The majority report favored the Lehman bill, which would let the New York Power Authority develop the river. The Capehart proposal, favored by three Republicans and one Democrat, would let private enterprise do the job.

The Capehart bill supporters argue that the project is not multipurpose, and involves no irrigation, reclamation, or flood control. It is purely a power project, and the federal government has never authorized public development of a single-purpose project. They also contend that private

enterprise pioneered hydroelectric development at Niagara.

Backers of the Lehman bill reply that under the Federal Power Act, state and municipal agencies are entitled to preference as applicants for licenses, provided that their plans for development are as much in the public interest as plans of private applicants.

In the lone view of Sen. Roman Hruska (R.-Nebr.) the decision should be based on a referendum of the people of New York State. A reservation in a 1950 treaty with Canada places the licensing of any project involving the waters of the Niagara in the hands of Congress.

Congress has authorized the deepening of the Great Lakes connecting

channels to a uniform depth of 27 feet, under the supervision of the U. S. Army Corps of Engineers. Existing controlling channel depths are 25 feet for ocean-bound traffic and 21 feet for lake-bound traffic.

The job will cost about \$110 million. When completed, channel depths will be comparable to those planned for the St. Lawrence Seaway. THE END

## RUGGED D8S 'DOZE ROCK on road to Donnells Dam



In rough mountain country above Strawberry, California, Tri-Dam Constructors are preparing for the \$32,000,000 job of building Donnells Dam.

One of the first requirements is an 8-mile, 24-foot contour road leading up to the dam site and permanent camp. And most of the roadway has to be blasted out of steep granite slopes like the one pictured. Handling shot rock on locations like this takes tough equipment. That's why Tri-Dam is using CAT\* D8 Tractors with No. 8S Bulldozers. There are 9 of them working on the project.

The D8 has been known as "king of the crawlers" for years. As jobs grew bigger and tougher, the tractor has grown with them. Today's D8 is new from the ground up—bigger, tougher, more powerful than any earlier model. Look at these features:

- New heavy-duty 4-cycle diesel engine delivering 191 HP at 1200 RPM.
- Choice of torque converter or direct drive.

- Oil clutch, for smooth performance and long work life.
- New 7-roller track frame and long-wearing "water quenched" track shoes.
- New, more powerful starting engine with "in-seat" starting.
- Better job visibility and greater operator comfort.

Your Caterpillar Dealer will be glad to show you how this new D8 can increase your production. And you can depend on him for prompt service and original parts. Ask him for a demonstration today.

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

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NAME THE DATE...  
YOUR DEALER  
WILL DEMONSTRATE



## *Authorities forbid breaker-ball, so contractor* **removes 8" concrete with 2¼-yd. Michigan**

Contractor Roberts E. Latimer, Jr., Inc., Silver Spring, Maryland, ran into trouble on a recent job. The contract called for removing a stretch of highway where the concrete slabs were 8-inches thick by 12-ft. wide. When they bid the job, they expected to break up the slabs with a breaker-ball. But when they went to work, authorities told them that a decayed 14-inch gas main ran underneath the road: "No breaker-ball—too dangerous".

### **Crane wouldn't work**

Latimer tried to break out the slabs with a ¾-yd. crawler shovel; it wouldn't work. Next they tried a crawler-loader; it didn't have enough lifting capacity or break-out power either. At this point Paving Supply and Equipment Co., Washington, D. C.,

suggested that they try a 2¼-yd. Michigan Model 175A on the job. Latimer frankly didn't believe that *any* type of loader could break out the heavy slabs—much less a rubber-tired machine. But they finally agreed to let the distributor demonstrate the Michigan. When they saw, they bought.

### **Michigan's exclusive break-out action**

The photographs on this page show how the 133-hp Michigan handles the job. The operator slips the bucket cutting-edge under the slab; then he applies bucket break-out action. When the slab has lifted about 2 feet, he eases forward, gets under the slab as he lifts the bucket. The concrete usually breaks as it's being raised. If it doesn't break, the Michigan pushes it over the curb

to a spot where the breaker-ball can be used safely. Then the Michigan loads out the chunks.

### **Moral: see it in action**

Like Roberts E. Latimer, Jr., Inc., more and more contractors are using Michigan Tractor Shovels as construction prime-movers. It's no accident that this machine will handle jobs that have never even been attempted on rubber-tired. The complete Michigan power-train—torque converter, power-shift transmission, planetary axles—was designed and built by Clark to give this machine more useable power and traction than you've ever seen on any rubber-tired tractor shovel. Before you decide that this type of machine can't handle a particular job, do what Latimer did. Ask for a Michigan demonstration. *You name the job.*



Up it comes as the operator slides the cutting-edge under the concrete and applies break-out action. Top photo shows how the slab usually breaks before it topples over.

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